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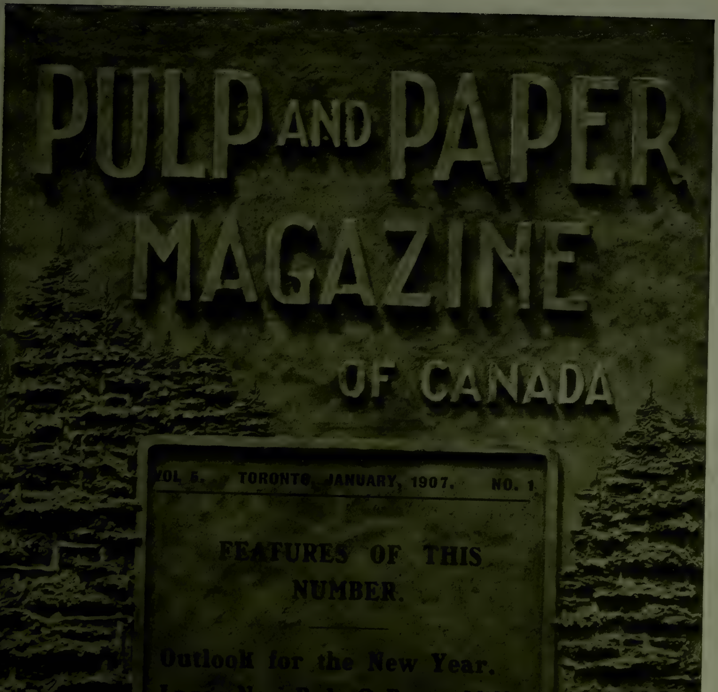

PULP AND PAPER MAGAZINE OF CANADA

VOL. 5. TORONTO, JANUARY, 1907. NO. 1

FEATURES OF THIS NUMBER.

Outlook for the New Year.
Large New Pulp & Paper Mills.
More Kraft Brown Notes.
Value of Canadian Pulp.
England Revisited.
The Electrolytic Bleach.
Western Canada as a Paper Market.

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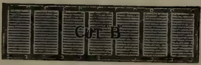

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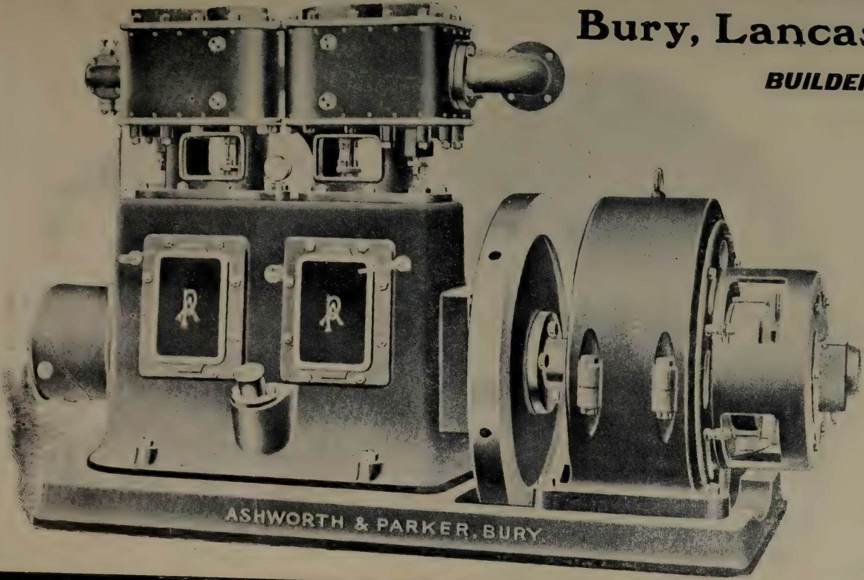

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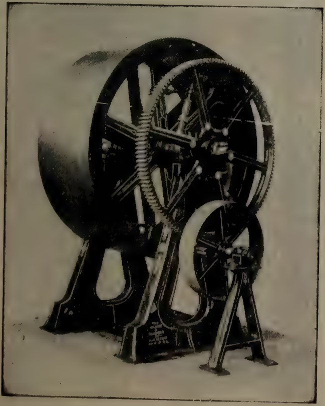

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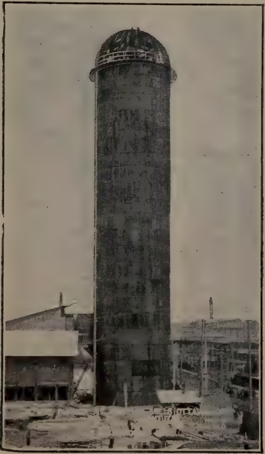

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THE PULP AND PAPER MAGAZINE OF CANADA

VOL. 5.—NO. 1. TORONTO, JANUARY, 1907. $1 A YEAR SINGLE COPY 10C

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade.

SUBSCRIPTIONS: Canada, British Empire and the United States, $1 a year; to Foreign Countries, 5s. a year.

The Pulp and Paper Magazine is published on the third Tuesday of each month. Changes of advertisements should be in the publisher's hands not later than the 10th of the month, and, where proofs are required, four days earlier. Cuts should be sent by mail, not by express.

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THE NEW YEAR.

The year 1907 opens under very satisfactory auspices for the trades represented by the "Pulp and Paper Magazine of Canada." Manufacturers are meeting with a very good demand for their products, and prices are on an improved basis compared with early in 1906. In fact, at its opening, and during a large portion of the progress of that year, the constant rise in the cost of raw materials, of labor, and of everything connected with the pulpwood industry, together later on with a shortage of rain and low water brought the mills face to face with a serious state of things. However, the last three months saw a very considerable improvement in this respect. Pulp and sulphite have been advanced to a more reasonable level, and paper has also felt the increasing firmness and activity of the market in a beneficial manner, so that it may be said that while profits have not been large, manufacturers can look the future in the face without qualms.

Another feature which is worthy of note is the increasing interest being taken in Canadian pulpwood and other resources by British and American and foreign investors, a fact which eventually must mean a great deal for the future of this country.

MORE KRAFT BROWN NOTES.

The articles presented by the "Pulp and Paper Magazine" on Kraft Brown continue to attract attention from many manufacturers and other people who are fully cognisant of the great importance of that branch of the paper trade. That this attention has been shown by British and foreign manufacturers rather than by Canadian paper manufacturers is a feature which should set the latter to some hard thinking. When the secret of Kraft Brown shall have become known to some one willing and able to take up the question of its manufacture in earnest, it will revolutionize some branches of the paper industry. Canadian manufacturers should wake up to grasp an opportunity that may not long be theirs. We have received the following particulars from a friend in England who is keenly interested in the whole subject:

Kraft paper was accidentally discovered about 1890 in a Swedish Paper mill. Some pulp, which was made by the soda process, was let down by a tender under-cooked. In order to utilise this, the half-boiled materials were rubbed-out in the kollergang or edge runner, and made into common wrapping for the use of the mill only. This was found to be much stronger than any other paper, and experiments developed this under-cooked pulp from which we get the Kraft Brown, which is both lighter and stronger than paper made from rope, Manila, fibre, etc. At the same time a peculiar nature is given to this paper by a special method of sizing, the size being obtained, it is said, from a residuum of the boil.

To produce the above results the pulp must be used fairly fresh from the digesters, beaten up by blunt-tackle and run off on a machine prepared to handle wet-stock. The secrets of the process are in the boiling of the pulp and sizing, and they are in the hands of a very few people.

In order to produce this I think it would be necessary to obtain an engineer or a chemist of experience in the production of this paper, who could build a mill and work it.

Attempts have been made in England from time to time to make the paper from imported soda and sulphite-pulp, but the true Kraft paper has not been successfully made by this means, because to get the best results the stuff should go as direct as possible from the pulp mill to the paper machine.

A very good imitation is, however, made by some English mills from the imported pulp, but it cannot command the same price as the foreign-made article.

Another correspondent reminds us that Canadian Mills interested in Kraft Brown would have the advantage of manufacturers in England, who have to rely upon the Scandinavians for their sulphite pulp, whereas in Canada they can make their own. The success of Swedish Kraft depends largely on this fact, that all the mills make their own pulp.

THE VALUE OF CANADIAN PULP.

In last issue the "Pulp and Paper Magazine" made some comments on the carelessness of Canadian manufacturers of ground wood pulp in keeping up the price of their article. The truth is they should get together at once and remedy affairs connected with their business which are not all satisfactory. Some of the mills are now selling to American paper mills at prices far below what they should actually get, and considering the price of wood and labor, they would make more selling the wood than converting it into pulp. The fact of the matter is that Canadian pulp makers have too often fallen into the hands of unscrupulous commission men, who have led them to believe that Canadian-made pulp is not up to the standard and can only be sold on favorable price conditions. There is one class of sales agents who have made a "set" on Canadian mills, and have carried on a regular campaign of misrepresentation.

If Canadian pulp makers would give the subject careful consideration and hold firm for better prices, business conditions would be materially bettered. A correct understanding can only be arrived at by a meeting of the mill men, and at the same time a strong committee could be appointed to press further for an export duty on pulpwood.

* * *

The paper trade is not yet clear upon all points in connection with the new tariff. For instance, manufacturers are by no means sure what the framers' intention was with regard to cardboard, or whether pasteboard should be included in the same schedule. Under the old tariff pasteboard paid 35 per cent.; but now, if it should be included under cardboards, the duty has been reduced to 25 per cent.

* * *

The manufacturers of book, litho and fine papers have come together and adopted practically the same trade customs or rules uniformly in use in the United States and England. Among the more important of these rules are these: On paper interlapped in bundles, the "standard" prices shall be calculated on a minimum weight basis of 24½x36½—36 pounds—500 sheets to the ream for machine-finished and 24½x36½—40 pounds—500 sheets to the ream for super-calendered papers. Average variation from the ordered weight is not to exceed 4 per cent. above or below the same. Paper must be marked by the manufacturer the ream weight ordered, without evasion by substituting letters or symbols. Wrappers and twine on both sheets and roll papers are to be included in the weight of and to be charged for at the price of paper ordered. Roll paper will be charged at the gross scale weight, including cores. Terms of payment will be three months from date of invoice, or 3 per cent. may be allowed for cash in 30 days.

"Not all the butchers and grocers are bearing the burden of increased cost of wrapping paper and bags," remarks the Paper Dealer. The same is true of Canada. Where goods are sold by weight, there is opportunity to weigh the goods in the bags and wrappers and thus storekeepers may get for the paper much more than they paid. If such storekeepers have already figured in the price of the paper as a miscellaneous expense to be divided as a certain fixed percentage on each dollar's worth of goods sold, then they get paid twice for the paper. Not all butchers or grocers follow this practice, but many do, especially of late in order to meet the advance in price of paper. The grocer gives net weight on sugar and tea when these articles are put up in the customer's presence. But during slack spells in business, he has his clerks make up parcels of tea, sugar, meal, flour, etc., and these made-up parcels of goods almost invariably pass from seller to customer without being weighed in the presence of the latter. There is little doubt of that though this of course is not the fault of the paper manufacturer, with whom our concern primarily is. In England, it may be remarked, people are agitating for a law which will require all goods sold retail by weight to be sold net weight, with the exception of butter, lard, drippings, etc., which may be sold by the gross weight.

* * *

LARGE PULP AND PAPER MILLS UNDER WAY.

Very extensive negotiations have been concluded in connection with the erection of pulp and paper mills at La Tuque, Que. A number of prominent men identified with the Berlin, N.H., Paper Mills, including Herbert J. Brown, of

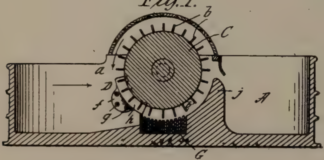
Portland, Me.; M. O. B. Brown, Berlin, N.H.; and Chas. Libby, solicitor, Portland, Me., together with W. Hamson, of the Quebec and Lake St. John Railway, and R. H. Weldon, of Montreal, are in the deal. They have already completed the purchase of the Breakey timber limits at La Tuque, for about $250,000, also the water-power and other properties leased to G. Stuart & Co., Tassier, for another million, and have organized under the name of the Quebec Industrial Co., having capital of $3,000,000, and with H. J. Brown as president, and M. O. B. Brown as secretary-treasurer. From what we hear we gather that the pulp and paper mills to be erected at La Tuque will be probably the largest in Canada. Work is to be begun in the spring, and rushed through as rapidly as possible. Their construction and operation will mean a great deal for the Lake St. John district and for Quebec.

* * *

NEW BEATING ENGINE.

Henry McGill, of South Hadley Falls, Mass., has invented certain improvements in beaters, the object of which is a combination of pulp stones to prevent the flow of substantial quantities of pulp and the avoidance of churning near roll ends. It is patented under United States patent No. 838,265.

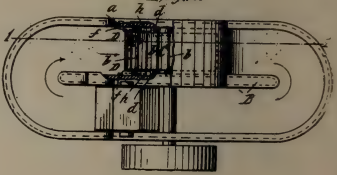
Fig. 1.



This invention is comprised in the combination, with the receptacle or vat of a beating engine having a midfeather and an axially horizontal peripherally bladed beater roll between and with its ends separated from the side wall of the receptacle and from the midfeather, of pulp stops in the spaces between the ends of the beater roll and the said side walls and midfeather adjacent to the lower rearward portion of the roll, the object of the invention in the provision or combination of the pulp stops in the stated situation being to prevent the flow of substantial quantities of the pulp between the ends of the bladed roll and the vertical walls adjacent thereto, but separated therefrom, and thereby insuring an avoidance of a churning of the pulp and the frothing thereof within the spaces adjacent the ends of the roll.

The improved beater is illustrated in the accompanying drawings, in which Fig. 1 is a vertical longtitudinal sectional view and Fig. 2 is a plan view, the section line 1 1 on Fig. 2 indicating the plane of section on which Fig. 1 is taken. Fig. 3 is a perspective view of one of the duplicated pulp stops.

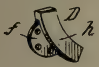
Fig. 2.



In the drawings A represents the receptacle or tank comprised in the beating engine, the same having, as usual, the midfeather B, between which and one side wall *a* of the receptacle is journaled the beater roll C, having suitably spaced on its circumference a series of longtitudinally extending and radially projecting beater blades *b b*. The axially horizontal roll and its blades have a length somewhat less than the distance between the side of the midfeather B and the side wall *a* of the receptacle, whereby spaces *d d* are left between the opposite ends of the roll and such walls, through which a portion of the pulp in its circuitous course around in the beater has heretofore been permitted to flow with the effect of a churning and froth producing result.

Letters D D represent the pulp stops, each consisting of a flat plate *f*, having holes for the passage therethrough of attachment screws *g g* and curved flangelike members *h h*, as clearly shown in the drawings. These stops are by the screws *g g* fastened on the receptacle wall *a* and midfeather in opposed locations, with the curved flangelike members projecting inwardly toward the opposite ends of the roll and with their positions adjacent the circular path of the beater roll blades *b* and near the lower rearward portion of the roll and to the rear of the bladed bed G. The pulp repeatedly moving forwardly from the beater roll passes around the forward end of the midfeather, back around the read end of the midfeather, and forwardly again between the beater roll and bed, upwardly to and over the back fall *j*, with no substantial portion thereof entering in the space between the ends of the roll and the walls adjacent thereto because of the presence of the stops D D, as manifest. By precluding the possibility of any portion of the stock in the beater passing into the spaces at the ends of the rolls adjacent to bedplate the entire contents of the beater must move more frequently under and subject to the action of the roll.

Fig. 3.



It has been proposed to construct a beating engine with the beater rolls so long as to practically fill the space between the midfeather and one side wall, but largely increased power is required to drive the roll in a receptacle of a desired width, it being usual to provide a receptacle A capable of receiving about 2 tons of stock or pulp, and therefore a beating apparatus made comparatively wide, as illustrated, having the spaces between the ends of the roll and the walls between which it is located and with the provision of the pulp stops, as shown, amounts to an actual and substantial improvement over those at present most commonly used.

ENGLAND REVISITED

(From a correspondent of the "Pulp and Paper Magazine.")

Letter No. 2.

Canadians who have not visited England are apt to think of English cities as composed entirely of old mansions, old slums and old churches and public institutions covered with moss and ivy, and grimy with the soot and dust of ages. It all depends, however, on what is the leading trade in the district you are visiting, and what the condition of that trade is. Take Macclesfield and Manchester as examples. For over a hundred years the silk trade of Macclesfield has been going down hill, and until the last three or four years venerable decay is written over all the business streets and residential quarters of that old town.

Spasmodic appeals have been made by silk manufacturers to the patriotism of Englishmen to support a home industry, but the average modern Englishman is not moved to the slightest extent by such appeals. "Buy in the cheapest market and sell in the dearest," is the inexorable logic by which such appeals are answered ever since free trade principles have been adopted in the Old Land, and the Englishman lives up to this motto with an impartiality that seems positively heartless to a Canadian who has been accustomed to season his business with a salt of local patriotism. And so in spite of the fact that, taken as a whole, the Macclesfield silk mill has produced more honest goods than his French or Swiss rival, silk spinning and weaving has diminished by slow degrees, while the masters of the industry have been compelled one by one to abandon their mills, sell out their homes, and seek business in other lands. Even the furniture and fittings of some of the venerated churches fall into the maws of the prowling hunter of antique furniture and relics. Of course, there are still English people who will have no silks but those of Macclesfield, and strange as it may seem, the silk goods woven on the old handlooms are more in favor with admirers of the home product than goods from the factory. So much is this the case that you will find in the neighboring villages and hamlets, such as Presbery, silk weavers at work day after day on looms which have been in operation in the same cottages for generations past, some of these handloom weavers having all they can do throughout the year. But this feature of the business is an exception to the general trend of the silk trade, and if Macclesfield is reviving somewhat within the past three years, it is because of the introduction of other lines of manufacturing.

Turning now to Manchester we have a great city which, like London, is at once old and young. The stranger who knows nothing of the history of Manchester will see by such structures as "The Shambles," "The Poet's Corner," and the "Seven Stars," ("the oldest licensed house in Great Britain,") that this must be a very old city. The very name is a memorial of its age, for it was one of the Kesters, or camps, of the Romans, and the first part of the name is a word meaning red rock, so called from the red stone which showed up where the Roman soldiers built their fortified camps, on a site now partly occupied by the old Cathedral. The old structures in the rear of the cathedral in which the John Chetham library is housed, are full of relics of the monks who occupied it in the days before the Reformation.

Leave these monuments of Manchester's antiquity and go in any direction you choose, and you will find Manchester to be one of the youngest as well as the oldest cities in Britain. Going into a district north of Alexandra Park I saw acres upon acres of ground covered with new houses, evidently built for the better class of artisans, clerks and tradesmen; all of these houses having the bright, attractive, tidy appearance of the most recently laid out streets in the residential quarters of a rising Canadian city. And adjoining these acres of houses were more acres of ground laid out for new streets, and covered with bricks and lumber for more new residential areas. Miles upon miles of such new streets in the making can be counted; and let me not forget to add that many a carpenter and mason who was working by the day a few years ago, but who had the courage and the executive ability to strike out and put his little money into building, has made a record equal to the tales of wealth-getting we hear from the new Canadian West. Oh yes, Manchester is young, and growing, and the textile industries upon which Lancashire chiefly feeds are still king. Readers have already heard that the increase in new cotton mills in a recent period of eight months exceeded the entire spinning capacity of Canada, and the increase of the past three years equalled the spinning capacity of the whole of the German Empire. Such facts give one an idea of the enormous development of the cotton industry of England; and explain why Manchester is at once the youngest as well as one of the oldest cities of Great Britain. Its youthful courage is shown by enterprises of far more importance than the extension of its homes and factories, but of these enterprises I will write in another letter.

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PRESERVING WET WOOD.

A cheap and effective method of preserving wet wood pulp for a considerable time, and of protecting it from moulding and spotting during hot weather, is to add a certain amount of aluminium sulphate, free from iron. This is added in the stuff trough before the pulp is drained in the draining machine. Preceding the latter must be a box with a stirrer, to mix the two well. If space permits, two casts are placed somewhat higher than the stuff trough, and the aluminium sulphate, dissolved, is let into the trough from one of these, and thoroughly mixed by means of the stirrer. The waste water from the draining machine is caught and added to the stuff again. Wood pulp from well cleansed and good fir wood, about three-quarters dried, and prepared with water containing no iron, will keep a long time if protected from light and air.—Papierfabricant.

The Electrolytic Bleach

Several advantages are claimed for the use of electrolytic bleach as compared with the ordinary chloride of lime liquor, but there must be some reason why the electrolytic bleach has not obtained a better foothold. It has been suggested that no suitable plant has been designed and that the difficulties which occur in practical work have not been overcome. It is, therefore, of interest to note a new form of apparatus described before the German Wood Pulp Association by Professor Kirschner at a recent meeting.

Among the numerous patents taken out in connection with paper making methods of preparing electrolytic bleach take their fair share. The author puts to himself the following questions: What progress has so far been made with electrolytic bleach?—What success has been obtained? and What are the chief advantages or disadvantages in contrast to chloride of lime bleach? The drawbacks of chloride of lime are known to all of us who have constantly to make use of this substance. On the other hand, the advantages of electrolytic bleach are, that one avoids the troublesome preparation of the bleach liquors, the residues in the dissolving tanks, and the dangerous effluents which have to be got rid of somehow. A well-built apparatus for producing electrolytic bleach alloys working in a cleanly manner at a low cost, taking it for granted that the water and steam power, as well as electrical installation, are to hand. These last conditions we assume to be fulfilled.

Professor Kirschner declares that he cannot speak with the authority of a practical paper-maker nor as an electro technologist, but he speaks in the interest of science, and with a view of promoting this particular branch of industry. For anyone who is thinking of putting in an electrolytic bleaching tank, the first question to be asked is, What is his present consumption of chloride of lime? Let us assume that some 500 kgs. of chloride of lime are used per day. This would yield 78.87 kilograms of a 35 per cent. solution, that is 135 to 150 kilograms of active chlorine in the bleaching engine. In order to produce daily 100 kgs. of chloride of lime, an electrolyser will be required yielding daily 27 to 28 kgs. of electrolytic chlorine, which will correspond to about 2.3 cubic metres of liquor containing 12 grams of chlorine in the litre, the gravity of which will be about 3 Be.

As to bleaching efficiency, this 3 Be electroyltic liquor will go as far as the same quantity of good chloride of lime liquor of, say, 4 Be. To replace 500 kgs. of chloride of lime we shall require five electrolysers, each of which will cost 4,700 marks (£235).

It is a very simple matter to work this apparatus. The outer stoneware vessels contains the cell of the electrolyser, and is supplied with a 14 or 15 per cent. solution of rock salt. The current is then switched on, and should be about 75 amperes and 110 volts. As soon as the current begins to pass, the mixture circulates of its own accord, in consequence of the hydrogen gas given off. It flows continually from the cells built of the electrode plates, entering at the bottom and leaving at the top by holes in the sides of the cell. From thence it passes around the coils of a condenser, cools down, and in this manner enters the cell at the bottom. In consequence of this circulation the liquid becomes richer in chlorine in the form of hypochlorous acid and sodium hypochloride, etc. At the end of seven hours about 750 litres of electrolytic liquor are ready; another hour suffices for decanting the liquor, running it off into a collecting basin, washing out and filling afresh with salt solution so that the electrolyser is capable of producing three lots of liquor—that is to say, 2,250 litres in 24 hours. At times when the electrolyser is working, a grey, oily foam appears on the surface, which arises from the addition of ¼ per cent. of petroleum. Any insoluble matters in the salt, together with particles of carbon, collect at the botton, but the liquor is completely clear and of a greenish color as it flows into the collecting tank. This collecting tank can serve as a second vessel for decantation to remove any traces of insoluble matter contained in the liquor, as well as acting as a reservoir. It is advisable to allow the electrolytic liquor to flow straight from the collecting tank into the bleaching engine without using pumps or similar plant. When once the current is turned on, the plant does not require any particular attention, merely an occasional glance at the amperemeter, and also at the thermometer, to see that the temperature does not rise above 38° C. A slight turn of the handle controlling the cold water supply will adjust this. It is sufficient if the temperature remains between 30 and 35°C. The water that passes through the condensing coils, but does not come into contact with the bleach liquor, leaves the apparatus just warm, anl can be used direct in other parts of the mill for ordinary purposes.

Cost of Replacing 100 Kgs of Chloride of Lime, by 27 to 28 Kgs. Electrolytic Chlorine, Water Power.

	Marks.
Approximate cost of 300 kgs. of rock salt; price, delivered in Saxony at 1.10 (at the mine, marks .60)	3.30
250-h.p. hours, at 1.2 pfg. the h.p. hour	3.0
Replacing electrodes (these last nine months)	0.60
	M. 6.90

We have to compare the cost, when working with chloride of lime, with the above figures. The cost of bleaching with chloride of lime will amount to sums as follows, per annum:—

	Marks.
150 tons of chloride of lime at 115 M.	17,250
Cost of preparing the solution, and attention to plant	750
Interests and amounts written off	500
	18,500

Hence when using water-power we could effect a saving of 5,500 marks, and with steam power 3,000 marks per annum.

The electrolytic bleach when compared with chloride of lime at 11.5 marks per 100 kgs., works out at the same cost, if we reckon the horse-power hour at 2.6 instead of 1.8 pfg. Even then the advantages and excellent quality of the material, as well as the ease with which it is worked, must be taken into consideration.

If, however, it is necessary to instal steam and dynamo plant to work the electrolyser, the case is considerably altered, and whether it would then pay to use electrolytic chlorine in the place of chloride of lime, is a question which the lecturer said he was unable to answer.

REVENUES FROM THE FOREST.*

By Dr. Judson F. Clark.

In the case of most crops produced by the soil there is a distinct seedtime and harvest and the methods of the seedtime are as different as may be from the methods of the harvest. Wood crops form a notable exception to this rule, for normally the new crop is launched by the act of harvesting the crop which is mature. Where there is no wood crop to harvest, artificial sowing or planting must be resorted to if a wood crop would be grown, but in Canada the areas which must be so treated are limited and comparatively unimportant.

Nature unaided by man has produced vast and magnificent forests and maintained them for ages. The earliest foresters went to nature centuries ago to learn her method of forest reproduction. They found that wherever trees were removed by decay, windfall or other cause, so as to make a break in the forest cover, and thus admit light to the soil, the opening became quickly filled with a vigorous reproduction of young trees. Trees are tolerably prolific seeders, but tree seeds on germination require light if they are to develop into forest trees. The more light they get the more rapidly they grow, and light may be given them by the removal of the mature trees. Such were the lessons learned from nature by the first foresters, and the natural laws behind these lessons must ever form the basis of all natural methods of forest conservation.

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*Condensed from a paper read before the Canadian Forestry Association, Vancouver, September 25-27, 1906.

The forester was quick to see wherein man might aid Nature to the advantage of the forest. Nature's method of waiting an age for the trees to disappear after they had passed their prime was wasteful alike in time and material. The forester with his axe saved the material and the time. In the virgin forest the fittest to survive occupied the soil, but the fittest to survive were not always the best fitted to supply the needs of man. This was remedied by the forester in the succeeding crop by favoring as seed trees those kinds which because of rapidity of growth or quality of product were regarded as the more desirable.

The Canadian Forest Problem.

There can be little doubt that the most important problem before any Canadian forest administration is that of translating the facts of these introductory observations into everyday business practice. The solution of the problem will be reached when a system of sale of public timber is evolved and made effective by which the State and the lumbermen become partners with mutual profit in the work of renewing the forest by the act of logging the mature trees.

The Importance of Selling Right.

Lumbering is very much like any other business in that it is conducted for what profit may be made by the operators, and rightly so. This being the case, it is evident that the nature of the agreement entered into by the State as the seller of the timber and the lumberman purchaser will have very much to do in determining the subsequent course of events. If the State offers its timber for sale under conditions which put a premium on forest destruction, the forests will surely be destroyed, all kinds of forestry propaganda to the contrary notwithstanding. If on the other hand the terms of sale put a premium on forest conservation, there is no reason why the forests should not be conserved as a purely business proposition.

Present lumbering methods are devastating the Canadian forests. Why is this? Lumbering is the business of removing the mature timber, and this should improve the forest. It has done so elsewhere for centuries. Not in Europe and Asia alone, but in many places in North America. Why does it not do so on the Canadian timber limits? There are, indeed, isolated examples of improvement by lumbering even here which show the possibilities, but the exceptions to the rule but emphasize the failure of the present policy as a whole.

It is my belief that the fatal weakness of the present system of disposing of provincial timber is to be found in the fact that the provisions of the agreements entered into by the provinces as sellers and the lumbermen as purchasers place a premium on destructive lumbering. In other words, the terms of sale which have found general acceptance make it to be in the financial interest of the operators to despoil rather than to conserve the forests.

It is my purpose in this paper to discuss two or three salient features, and at least one notable omission in these agreements, with special reference to their influence on the character of the logging which they authorize, and should, but do not, control.

Before entering on what may prove to be controversial ground, it seems fitting to state three propositions which I think will be accepted as axiomatic for Canadian conditions. These may later serve as landmarks when weighing the pros and cons of individual propositions.

1. The main object of all forest management should be to insure the permanency of the lumbering and other woodworking industries by providing a permanent supply of logs, which is their raw material. Incidentally, or at least secondarily, forest management aims to regulate the flow of streams, to secure a revenue, to ameliorate climatic conditions and to provide a playground for the people.

2. Wherever forests naturally flourish they may be perpetuated and improved by conservative lumbering. The white pine and the Douglas fir are among the best trees in the world for this purpose.

3. If the forests are to be saved, it must be with the sympathetic co-operation of the men who cut the trees. Nor is this at all a matter of regret, for no class of citizens are more vitally interested in the perpetuation of the forests or would do more to that end than the lumbermen.

The principle of valuing stumpage for sale purposes by offering it at public auction has long found favor in the older provinces, and I note that British Columbia has recently taken legislation providing for its adoption. There can be no doubt that public auction after ample advertisement and oportunity for inspection is by far the simplest, most equitable and, above all, the most satisfactory method of determining the market value of standing timber.

This sale by public auction may take either one of two forms: (1) The stumpage dues (i.e., the price to be paid per thousand feet when the timber is cut) may be fixed in advance of the sale, and bids may be asked for a lump sum or "bonus," which will represent the estimated value of the stumpage over and above the fixed stumpage dues, or (2) bids may be asked on the amount of stumpage dues to be paid per thousand feet board measure when the timber is cut.

The Bonus System of Auction.

The first method, which may for short be termed the bonus system, has found general acceptance almost to the exclusion of the second. The advantages claimed for it are:

(1) That it yields at once a large revenue to the provincial treasury; and

(2) That it gives the purchaser of the stumpage a larger interest in protecting the forest from fire.

The payment in advance in the form of a bonus of a portion of the estimated value of the stumpage to be cut during a period of years is in reality a discounting of the future revenue-producing capacity of the forest. This method of realizing a large present return from what is a permanent provincial asset capable of yielding a regular annual income can, it seems to me be justified only as a means of meeting a financial emergency of the gravest character. It is worthy of remark in this connection that even the stress of war has never led the forest-owning countries of Europe to resort to this method of temporary relief for their depleted treasuries.

The disadvantages of the bonus system may be discussed (1) from the standpoint of the operator and (2) from that of the province.

1. From the operator's standpoint it means:

(1) Capital tied up.

(2) Increased cost of inspection.

(3) Cost of raw material uncertain.

2. From the standpoint of the province as seller:

(1 and 2) That it causes much irregularity in the forest revenues, also its undesirable tendency to limit the number of competitors in a position to bid at timber sales.

(3) Large losses in revenue.

(4) Bonus system means close cutting.

(5) It places a premium on violation of cutting regulations.

The placing of the whole payment of the lumberman's price for the logs as stumpage dues of so much per thousand feet, to be paid when the logs are cut, and the determination of the amount of the price by public competition meet every objection which can be taken to the bonus system of auction, whether viewed from the standpoint of the operator or that of the province.

Large capitalists who can command sufficient credit to deal in timber lands under the bonus system of auction would very probably not look with favor on a change to a form of auction which would divert a much larger proportion of the natural increase in stumpage values to the provincial treasury. It would, on the other hand, be warmly welcomed by operators of limited capital, and would work injustice to none.

Its practical application on a very large scale on both public and private lands has abundantly proven its practicability and efficiency and its special value as an aid to conservative forest management.

It will bear emphasizing here that what is said below in regard to the desirability and necessity of defining and protecting the rights and duties of both parties to sale contracts applies equally to sales on a stumpage basis. Experience has shown that the point to be especially cared for under this form of sale is the prevention of waste of inferior material in the woods. Neglect of this matter may lead to serious loss and bring undeserved discredit on the system.

Wherever State or private forests are managed with a view of continued wood production, the most important feature of a sale of standing timber is the agreement as to the rights and duties of the contracting parties. This usually takes the form of a code of regulations specifying what trees are to be cut, the care to be taken in the felling and removal of the timber and similar matters.

These cutting regulations are, of course, drawn up in advance of the sale, and the prospective purchaser makes his bid with a full knowledge of what will be required of him should he be the successful bidder. A feature of these agreements is usually the giving of a bond by the purchaser as security for the faithful performance of the contract in accordance with the regulations.

The dearth of any effective measures to control the cutting on Canadian limits is an outstanding feature of the present forest policy or lack of policy. Perhaps the forest departments have acted on the theory that the lumberman's interest in future supplies of logs would insure careful and conservative cutting. Perhaps it has been because there has been no public demand for it—the public knowing nothing whatever about it. Be the cause as it may, the absence of such regulation has long since ceased to be a danger merely. To-day it is nothing short of a disaster; a disaster alike to the future of the lumbering industry and to the future forest revenue.

The reservation by the provinces of the right to change from time to time the terms under which the timber already sold might be logged is of interest in this connection. If I mistake not, British Columbia has also adopted this feature in her recent forest legislation.

In so far as the rights reserved by this provision are exercised for the general public good in meeting unforeseen or unforseeable contingencies, the reservation serves a just and useful purpose. In so far, however, as it is merely an aftersight method of providing regulations for the control of logging operations which ordinary foresight would have provided in advance of the sale, it must be regarded as unwise and unjust, and, therefore, impotent. Certain it is, were the powers thus reserved at all frequently called into requisition, it would quickly transform the purchase of public timber from a business proposition to a mere gamble, with a vast deal of lobbying and wire-pulling thrown in. Needless to say, such a state of affairs would work great injury to the lumber interests and to the forest.

Ground Rent Taxation.

A feature of all Canadian timber sales is the imposition of a land tax or "ground rent" per unit of area. British Columbia has made the imposition of a very high land tax a distinctive feature of her forest policy.

If the province grows the timber and merely sells the stumpage when it is mature, distinctly specifying what trees are to be cut and how, and when they are to be cut, there can be no objection to the payment in this way of a small portion of the market value of timber sold, and it may indeed serve a very useful purpose in preventing purchase for speculative purposes by others than bona fide operators.

Should, however, the responsibility for caring for future wood crops be left to the lumberman, as it has been in the past, it will be necessary for him when planning logging operations to consider carefully whether it will pay him to cut with care that he may return again after a period of years for a second crop—reasonable safety from fire being assured—or whether the tax will eat up the profit of any yield that he may hope for over and above what can now be realized by cutting clean without regard to the future. This is the only point of view from which the lumberman as a business man can regard the logging of lands under his control.

The policy of selling vast blocks of timber and pulpwood decades in advance of trade requirements, to be the happy hunting grounds of timber land speculators, has cost the forest revenues millions of money and will cost them many millions more. The province of Ontario has been very much more conservative in this regard than others which might be mentioned. And yet it would probably be safe to say that the average log cut in 1905 in the province of Ontario was sold a quarter of a century ago. This, of course, means that the average log is paid for at a price which has long since ceased to represent more than a fraction of its market value.

A reasonable time must of course be allowed for the removal of timber sold, but there is no justification for the enormous sacrifices in ultimate revenue made by the provinces by this practice.

To insure that my criticism be conservative rather than destructive, I submit an outline of the method of disposing of Crown timber which appears to me to offer a simple, practical and businesslike solution of the problem. It might be added that this method of sale in all its essential features has already proven its efficiency in practice in large transactions and under conditions not unlike those obtaining on the Canadian timber lands.

Preparatory—A first step in the preparation for a sale of timber should be to make an estimate of the quantities of the different kinds to be sold for publication with the advertisement of the sale. An estimate of the value would also be made, this latter for the use of the forest department in determining their reserve bid.

Advertisement—The advertisement in the case of large sales should be published at least a year in advance of the auction, that ample opportunity may be given for completing business arrangements looking to purchase and for the exploration of the tract by prospective purchasers.

The advertisement should state the location and area of the tracts offered, the approximate stand of the different kinds of timber and the time and place of auction. Intending purchasers should be invited to apply for information regarding the rules and regulations governing the cutting and removal of the timber, the manner of payment and other details.

Cutting regulations—The cutting regulations should be prepared with special reference to the individual tracts offered for sale and would be governed by local conditions.

In general they would include:

The designation of the timber to be cut, and conversely, specifically prohibit the cutting of timber not offered for sale—for example, immature timber under a set diameter limit.

Provision for care in the felling and in the removal of the timber.

Provision for the prevention of waste by limiting the height of stump, by prescribing the saw where practicable and by providing for the utilization of inferior materials.

Provision regarding the disposal of the debris—such as lopping tops, burning brush, etc.

The time limit for the final removal of all timber sold.

Specifications as to measurement of timber logged.

Adequate penalties for violation of cutting regulations, as, for example, payment at double the regular purchase price for any merchantable timber left in the woods by the loggers.

Time and manner of payment.

Provision for a bond to insure the faithful performance of the contract by the purchaser.

Method of Sale—By public auction, bids being asked on the amount to be paid per thousand feet when the timber is cut.

Ground Rent—To prevent speculative purchase by others than bona fide operators a fairly high ground rent per mile might with advantage be provided for. The payment on account of ground rent for any particular year might be made to apply on the stumpage dues account for the same year. This would throw the whole weight of the ground rent taxation on the purchaser who failed to operate, and would at the same time provide automatically for release from taxation immediately that he actively undertook to carry out his obligations.

Unit of Area—The square mile forms a desirable sale unit. This would give lumbermen of limited capital and jobbers an opportunity to do business on the public forest lands, and if the number of miles which any one concern may purchase be unlimited no injustice will be done the largest operators.

* * *

WESTERN CANADA AS A PAPER MARKET.

The progress of the paper trade of the great West is a good index of the creation of the new empire that is being built up beyond the Great Lakes. Seven years ago there was practically but one establishment in Winnipeg or beyond, which was solely concerned with the paper industry, if we except the defunct paper mills at Portage la Prairie, Man., and Alberni, B.C. Now J. C. Wilson & Co., of Lachute, and Montreal, have an immense paper warehouse; Douglas & Ratcliff, of Toronto, have just finished another, and other mills such as the E. B. Eddy Co., of Hull; Alex. McArthur & Co., of Montreal, have important agencies in Winnipeg, while the Stovel Company are not only large engravers and printers, but large manufacturers of paper products. The Winnipeg Paper Box Company hitherto a department of the Crown Soap Co. has been enlarged into a separate business, while the paper box department of R. J. Reid & Co., has grown to such dimensions that it has been found necessary to move from the Smith Street building to a new building specially constructed for the business at the corner of Parr and Jarvis Streets. This building has a floor space of 10,000 feet, has its own power and lighting plant, and is equipped with the latest machinery for paper box making. It is carried on by a joint-stock company under the name of the Hitchings Paper Box Company, Limited, with J. R. Hitchings as president, W. D. Inglis vice-president, and C. L. Blackwell manager. Part of the plant of the old Manitoba Paper Company at Portage la Prairie has been removed to Winnipeg, where Merrick, Anderson & Company have established works for tarring paper, the paper being purchased from eastern Canadian mills. There are a number of other industries associated with the paper trade which have been established in the West in the past seven years; while the printing establishments have become not only numerous, but many of them do a volume of business that would surprise easterners.

The growth of the newspaper press of the West is perhaps the most astonishing feature of the paper industry in the West. Many towns which a few years ago had wretchedly printed weekly papers now possess daily papers equipped with their own engraving, illustrating, and stereotyping plant and type-setting machines equal to those of big cities in Ontario and Quebec. An interesting example of western newspaper growth is furnished by the records of consumption of paper by the Manitoba Free Press, of Winnipeg. The annual consumption of paper by this journal in the last seven years is as follows:—

	Tons.
1900	644,640
1901	999,217
1902	1,290,492
1903	1,972,098
1904	2,791,356
1905	3,573,704
1906	4,160,398

The consumption of paper by the "Free Press" now averages over 8 tons per day.

As users of newspaper print the "Free Press," of Winnipeg, is now said to rank third among the newspapers of the Dominion. In the printing of their daily and weekly editions this western paper, it is reported, use a larger tonnage than any other newspaper in Canada, with the exception of one English and one French paper. Another interesting fact as showing how Winnipeg has grown to metropolitan dimensions is that a recent issue of the "Free Press" had more condensed advertisements than were contained in the corresponding issues of the large dailies of the East.

* * *

NO OVERPRODUCTION IN SCANDINAVIA.

The official report of the annual general meeting of the Scandinavian Cellulose Association, held recently at Stockholm, states that there is no reason to fear an overproduction for the year 1907, in spite of the great number of new mills that will be started. Both the old and the new mills have already disposed of the bulk of their production, and considerable sales for several years ahead have taken place. It was, however, acknowledged that the building of new mills during 1906 and 1907 has become so great that prospects for the period after 1907 would be rather dark, if a couple of years did not pass by without the starting of new mills to any considerable extent, in order to leave time for the consumption, particularly of sulphite, to overtake the increase of production which will be caused by all the new mills whose production has been reckoned with in the calculations for 1907 and 1908. A number of sawing mills in Swedish Norrland having already acquired cellulose mills and the price of wood having risen so much, it was the hope of the meeting that the other sawing mills who could easily sell their wood and who have planned the establishment of sulphite mills would await an increase of the consumption before realizing their plans. This increase is a necessary condition of the profitableness of any new mills, the more so as all raw materials for the cellulose industry have risen and continue to rise in price, and wages are also constantly rising. The production of sulphite in Scandinavia is calculated for 1907 to amount to about 540,000 tons, and of sulphate to about 100,000 tons.

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—The "Papier Zeitung" describes a new paper machine recently constructed by J. M. Voith, of Heidenheim, for making news and boards. The design conforms more to American practice than is usual in Germany, since it is provided with 41 drying cylinders, but instead of using sail-cloth felts without felt-dryers, woolen felts and dryers are installed, one felt and dryer being provided for every five cylinders. Between the 30th and 31st cylinders a calender is interposed, principally for making boards, and after the 41st cylinder there is a 7-roll calender. The machine is driven by a 300-h.p. steam engine adapted to be run at from 45 to 120 r.p.m., the exhaust steam being used for heating the cylinders. Paper can, it is stated, be made on this machine at 430 feet per minute or even faster. It is calculated that this machine, which can make 25 tons in 24 hours, should save £1,000 per annum, as compared with an electrically-driven machine using live steam.

Pulp and Paper Handbook of Canada.

Fifth edition published in connection with Canadian Textile Directory. WILL BE READY AT AN EARLY DATE.

This Directory will give full information regarding the pulp and paper mills of Canada, the officers, managers, superintendents, capacity, power used, particulars of machinery, kind of power used, products of each mill, and selling agents, if any. Also all the available information to the time of going to press of new mills projected; paper box factories, paper bag manufacturers, wholesale paper dealers, jobbers, bookbinders, etc.

THE REVISED CANADIAN TARIFF as it affects the pulpwood, pulp and paper industries, pulp and paper machinery and mill supplies will also be given; also the tariffs of the U.S. and Newfoundland. The book will contain every up-to-date feature required of a first class directory, including a complete set of exchange tables.

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Blotting Papers

There are many mills which make a practice of making blottings alternately with other sorts of paper. It often happens that at one time blotting is being made and at another writing paper or loans, using the same beating engines and the same paper machine, and at times even the same raw materials. In the course of my experience I have often had to make blotting paper in this way in different mills, both good and bad.

I happened, on one occasion, shortly after having taken up a fresh position at a mill, to have a quantity of blotting paper to prepare of various qualities, color, substance, etc. The paper was intended chiefly for the English and American markets. On former occasions the mill had produced considerable quantities of blottings which had partly satisfied its customers and partly not, and in order to make certain that the paper should this time satisfy requirements, we applied for a number of samples of good blottings from the English warehouse for whom the paper was intended. A few days later the English stationer himself appeared upon the scene with the samples that he had been asked for. After a little conversation the different sheets were laid upon the table, at which I remarked that our samples were better looking than his. In reply he said "Blotting is not paper." That is to say, he wished to emphasize the fact that blotting paper is something other than ordinary paper and must be judged by a different standard. Taking a bottle of ink which was filled to the height of about half an inch, he dipped a pen into it and sprinkled the ink on the sheet of blotting paper spread over the table. One could not help remarking that the ink was immediately absorbed by the paper. This happened with one of his samples which he declared to be the best. He then applied the same test with a number of other samples, and convinced us that the test, when properly carried out, shows the degree of suction and ease with which a blotting paper is wetted. It is, however necessary to take a particular type and quantity of ink so that the same quantity drops from the pen each time. Moreover, the pen must be shaken in the same manner at each drop. It is easy to understand that with an inferior paper the drops will not be absorbed so quickly. As a control of this method the gentleman made use of another test. He took a fair sized piece of writing paper and drew on it several broad lines, which he immediately blotted on a sample of the blotting paper by laying a half-pound paper-weight on the top of the paper. Almost all the blottings stood this test and showed no spreading of the ink line, but on drawing thicker lines some spreading took place, so that it was possible to measure the value of the blotting from the breadth of the ink line. Some of the blottings which stood the test well did not satisfy the English gentleman because fibres were easily detached when the paper was rubbed with the hand, as one would do in pressing the blotting on to the writing to be blotted.

The tests I have described made it necessary to examine the blotting more closely, especially to see what kinds of raw materials they were composed of, and to what extent the pulp had been beaten. As the result of further microscopic and other tests the mill in question was able to produce large quantities of blotting paper to the satisfaction of its clients.

In case of each paper where the best results were obtained, a microscopic examination showed the presence of wool fibres mixed with cotton. Some samples showed six to sixteen per cent. of wool, others only traces. The wool fibres appear to give the paper a low consistency (in bulk) without loss of strength, and they also increase the rate of absorption. Wool fibres are covered with scales, often taking the shape of half circles, which lend to its peculiar properties. The presence of these wool fibres means something more than this. It is well known that wool and other fibres of animal origin are destroyed when boiling with alkaline liquors. Wool is contained in rags in admixture with cotton and other fibres, and on boiling such rags with lime or soda they will be destroyed and dissolved, so that the presence of wool fibres in many blottings is considered by some a sign that the rags used were not boiled with alkalies. Mills working on these lines were able to produce excellent blottings. The mill in question, as a result of these investigations, took to the manufacture of excellent blottings in which only unbleached and unboiled woolen rags were used for the corresponding colored varieties. For white blottings and as an addition to the colored varieties the pulp was bleached. As a rule, white or red blottings were required, and were obtained from the corresponding colored rags. Where necessary aniline color was added. For the production of white blottings white cotton rags were thoroughly sorted and dusted, and were then put straight into the breaker and washed without previous boiling. The rolls for the half-stuff had knives 8 mm. thick and ground to from 1½ to 2½ mm. The knives in the bed-plates were ground to 5 mm., and these fixed knives were changed as soon as they became at all blunt. One of the engines was fitted with bronze knives, and gave better results, while at the same time the knives were less worn away. The rolls revolved at 280 to 300 metres per minute, and no advantage was gained by increasing the velocity, as the resulting paper was less absorbent and a large proportion of the fibres torn and split. What is required to give the best results is comparatively slow velocity of the rolls, sharp tackle and thin pulp. The stuff was beaten short in the half-stuff hollander, so that 10 to 15 minutes was sufficient time in the beating engine to complete the treatment, it being merely necessary to brush out the knots. The white half-stuff was bleached with 1½ to 2 per cent. of chloride of lime added in the form of a clear liquor, and after emptying the engine, allowed to drain 8 to 10 days.

Most of the blotting paper required was of the well-known red color, which was obtained by using the red cotton rags treated in the manner already described. Unfortunately the supply of red rags was not sufficient and had to be replaced by lighter colored rags, sometimes bleached and sometimes unbleached, according to circumstances, and colored with a little permanent red or crocein scarlet. For every 10 kilos of pulp a hundred grams of the former or 5 to 15 grams of the latter were used. The coloring matter was first dissolved in alcohol and then diluted with water and poured into the engine through a sieve. This method of dissolving aniline color works very well for blotting papers, although it would be unsuitable for sized paper, as it would interfere with the sizing. In most cases one-third red rags and two-thirds bleached light-colored rags were used, with a sufficiency of aniline dye.

The above is abstracted mainly from an article in "Papier Zeitung," but "Paper and Pulp" considers the methods of testing given above are scarcely sufficient ground on which to form an opinion of a blotting paper. If merely concerned with the behaviour of a fresh sheet, the tests described would prove useful, but they give no idea to what extent a sheet can be used or how it will behave when it has been used a good many times. Will it rapidly clog up and begin to smudge, or can it be used again and again where the ink has dried into it several times This question can be answered by examining for the non-absorbent ring in the manner we have already described in our ring tests.

* * *

TRADE ENQUIRIES.

The following enquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these inquiries, with their addresses, can be obtained upon application to Superintendent of Commercial

Agencies, the Department of Trade and Commerce, Ottawa, or the "Pulp and Paper Magazine," Toronto.

Paper Making Materials.—Yorkshire firm make inquiry for Canadian buyers of second-hand paper making materials; and also for buyers of bags for nails, bolts and washers, &c.

Agent.—A Manchester firm manufacturing glazed and other fancy papers is prepared to appoint resident agent possessing an established connection.

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NEW COMPANIES.

Electric Publishing Co., Toronto, capital $40,000, has received a charter. Among those interested are G. P. Magann, and P. F. Cronin.

The Dominion Envelope Co., Toronto, has been incorporated with a capital stock of $100,000. Edward Newell, and J. Curry, T. McMillan, and H. A. Lawrence are provisional directors.

United Editors, Limited, Toronto, have been incorporated with a capital of $20,000, to carry on a printing and publishing business. The provisional directors include J. Castell Hopkins, Toronto.

The Book Supply Company, Toronto, have been incorporated with a capital of $40,000, to carry on a printing and publishing business. Among the provisional directors are W. J. Elliott, R. D. Hume, and H. P. Cooke, Toronto.

The Ottawa Valley Development Company will apply to the Dominion Government for a charter authorizing it to develop water-powers, deal in lumber, pulp-wood, etc., and to construct necessary plant for the same. The solicitors for the concern are O'Meara and MacInnes, Ottawa.

The Queen City Trading and Transportation Company, Limited, has received a British Columbia charter, authorizing it, with a capital of $20,000, to purchase timber lands, manufacture cement, construct saw-mills, electrical works, and carry on business as saw-mill and pulp-mill proprietors, and buy, sell, and deal in wood and all articles made thereof.

Schofield Bros., St. John, N.B., having been incorporated as the Schofield Paper Company, the business will be carried on under the latter name.

British Columbia Timbers, Limited, Montreal and Revelstoke, has been incorporated for the purpose of acquiring timber limits, saw-mills, pulp-mills, water and steam powers, etc. W. Irving Briggs, of Revelstoke, is the company's attorney.

The Manitoba Printing and Manufacturing Company, Limited, has been incorporated to acquire the business now carried on by the Manitoba Printers & Publishers, and to purchase the bookbinding and paper-ruling business of the R. J. Reid Company, Limited. Capital stock is $100,000.

Th Delany and Pettit Land Paper Co., Ltd., Toronto, capital, $50,000, has been incorporated under Ontario charter. It will manufacture and deal in all kinds of sand-paper and sand-cloth, deal in glue, etc. Chas. Delany, of Philadelphia; and C. S. Pettit, and F. W. Burke, of Toronto, are interested.

The Cobalt Bloom Newspaper Co., Lt., Cobalt, has been incorporated with a $40,000 capital. It will acquire, print, and circulate newspapers, and carry on business as general printers, engravers, bookbinders, stationers, etc. J. C. Ritchie and J. A. MacMurchy, of Toronto, are provisional directors.

Frank McCrea, of Sherbrooke, Que.; E. W. Tobin, of Bromptonville, Que., two well-known dealers in pulpwood, and others, are applying for an act to incorporate a railway company, to construct and operate a line from a point near Sherbrooke, to a point near Quebec, together with usual incidental powers.

The International Power & Development Company will apply to the Dominion Government for authority to acquire, own, and operate the water-powers on the Pigeon and Arrow Rivers, in Thunder Bay and Rainy River districts, and to construct and develop works, canals, raceways, dams, etc., for the purpose of building and maintaining electrical and hydraulic works. Another concern, the Port Arthur Power and Development Company, will apply for similar privileges on the Nepigon, Black, Sturgeon and Pigeon Rivers. Albert E. Honeywell, Ottawa, is acting for both.

Application will be made to the Quebec Legislature by "La Compagnie de Pulpe de Metabetchouan," for the passing of an act to ratify a deed of assignment of all the assets of the company, by Louis Joseph Bérubé, to Fidèle Blouin, Joseph Samson, and Joseph Edouard Caron, to ratify a certain deed creating a trusteeship, to amend its charter by substituting the name of "La Compagnie de Métabetchouan" instead of "La Compagnie de Pulpe de Métabetchouan," etc.

Forestry News

The New Brunswick Forestry Association will hold their annual convention in Fredericton, Feb. 20 and 21.

Winnipeg lumber dealers announce another advance of $1 to $3 in the price of lumber, and still another is more or less expected.

British Columbia Lumber-mill owners are asking that leases granted for pulp cutting should be cancelled if the provisions of the statute have not been carried out. Large areas are held under pulp leases, and good limits for lumber purposes are not easily accessible, and so lumbermen want the former areas to be thrown open to public competition.

J. Foley and J. & A. Mulvey, of Stillwater, Minn., have carried though a deal with the British Columbia Government for the purchase of fifty-two sections of land on Queen Charlotte Island, and have, it is understood, resold it to A. M. Sheldon, A Harrington and P. L. Moore, of Minneapolis. It contains, it is said, about a billion feet of spruce, cedar and hemlock timber.

Tenders are called by the Ontario Department of Lands, Forests and Mines for the right to cut pulpwood on an area comprising about 900 square miles in the district of Nipissing, north of the townships of Holmes, Burt, etc., immediately west of the interprovincial boundary line. Tenderers must state the amount of bonus they are prepared to pay in addition to the regular dues fixed by the department, and, if successful, will be required to erect mills and manufacture the wood into pulp in the Province.

The Ontario Department of Lands, Forests and Mines estimates the timber cut in the Province during the present season as follows: Pine, board measure, 1,000,000,000 feet; hemlock, 70,000,000 feet; spruce, 1,500,000 feet; squared timber, 1,250,000 cubic feet; railway ties, 4,500,000; pulpwood, 100,000 cords. These amounts are all larger than the actual cut of last season, but it is expected that they will be realized owing to the great demand for timber of all kinds.

News of the Mills

The pulp mills at Sault Ste Marie, Ont. are now running full blast.

The Spanish River Mill is running at full capacity and turning out 120 tons of pulp per day.

The Glen Miller Paper Mills, of Trenton, Ont., will erect a reinforced concrete building.

The Dominion Paper Mills have been closed down for a short time pending repairs and improvements.

The Royal Paper Mills at East Angus, Que., are working full time, having now all the water they require, after a long period of scarcity.

Wabigoon, Ont., ratepayers have passed a by-law in favor of exempting the Dryden Pulp Mill property, owned by Charles Jordan, from taxation for ten years.

John Craig, receiver for the Imperial Paper Mills, is trying to get the courts to declare that the Quebec Bank has no title to the assets of the company as against the receiver.

Chaudiere Falls waterpower on French River, leased to Sturgeon Falls parties, have reverted to the Crown on the ground that the conditions respecting a certain degree of development have not been complied with.

The Rolland Paper Co., Montreal, held their annual meeting on the 15th inst.

The Moore & White Paper Machinery Co., Philadelphia, are rushed with orders, but are prepared to supply all kinds of paper machines, making the time of delivery to suit.

John Burns, an employee in the barking room of the Miramichi Pulp and Paper Company, Chatham, N. B., had his right leg torn from his body, death resulting in a few moments.

The large dam at Fort Francis, Ont., and the power house will be constructed shortly, and the several industries interested, including a 300-ton pulp mill, will, it is expected, have a sufficiency of power very soon.

The Jonquière Pulp Co., Jonquière, Que., are erecting an eight-ton sulphite mill which is expected to be in readiness for operation by April 15th. The annual meeting of this company will take place on the 25th inst.

There have been better water power conditions to favor the Booth and Eddy factories near Ottawa since the winter started. At the Booth mill attention is being confined for a while to news paper. Operators at the pulp mill have been interfered with by anchor ice. It has been found in the the past an advantage to stop the machinery without attempting to fight this impediment.

The Ottawa Pulp and Paper Co., a branch of the Indestructible Fibre Co., Messena, N. Y., which makes car-heading fibre boards etc., is converting the building in Ottawa formerly owned by the Ottawa Saw Co. into a fine and suitable factory for its own purposes. A large quantity of machinery has been installed, and the work will soon be begun of making fibre for the interior sheeting of cars, buildings, &c. About eighty men will be employed.

James Davy, the well-known manufacturer of ground wood pulp, is making extensive additions to the equipment of his pulp mill at Thorold, whereby the capacity will be more than doubled. These will be completed in the course of a couple of months, and then Mr. Davy will be in a good position to meet the large demand for his product which has continually gained in favor both in Canada and the United States. The mill at Thorold is particularly well situated, having a plentiful supply of water the year round.

A special bargain in a cylinder paper machine is announced on page 51 of this issue. This is a first-class machine, but the owners being very extensive manufacturers, wish to replace it with a larger one. Full particulars may be obtained by addressing "Paper Manufacturers," care of "Pulp and Paper Magazine," Toronto.

The B. Greening Wire Co., of Hamilton, send us a copy of their illustrated calendars. The design shows portraits of the President and incorporator of the present firm, the founder of the business in Hamilton, and of the founder of the present firm in Warrington, Eng., from which place the late Benjamin Greening came to Canada. Anyone interested should write the company in Hamilton, stating which branch of business he is connected with, as a different calendar is issued for each department. The company is making plans for considerable extensions this year in order to take care of the constantly increasing volume of business.

In answer to our enquiries re. the old paper mills at Portneuf, Que., reference to which was made in last number, Mr. Ford, Jr., courteously supplies us with some additional information. Mr. Jackson in his time made handmade wrapping paper. Mr. MacDonald also made handmade wrapping and news print, and writing paper, and then put in a small cylinder machine to make the same papers. Afterwards Peter Ford made straw and paste boards, and straw wrapping paper. The stock was brought from Quebec and Montreal, in summer by boat and in winter by sleighs. The paper was conveyed to market in the same way. Quebec is distant from Jacques Cartier 30, and from Montreal 150 miles; so that carriage must have been quite an item. Mr. MacDonald's daughter and Peter Ford are still living and in Portneuf.

With Bentley & Jackson, paper mill engineers, of Bury, Lancashire, England, the year 1906 was a very busy one.

Among the fine pieces of work turned out from these reputable works during the past season was a drying cylinder cast in one piece, 12 feet in diameter and 10 feet 4 inches on the face and weighing 20 tons. This is the largest drying cylinder in the world for the class of paper for which it was made. It is used in an English mill. Messrs. Bentley & Jackson recently started up paper machines at Y. Duxbury & Sons, Bury; Ramsbottom Paper Co., Ltd., Ramsbottom; Turner Paper Co., Ltd., Radcliffe, and are building a fine new machine for printings for the East Lancashire Paper Co., Ltd., Radcliffe.

The International Paper Company, the holders of Letters Patent of the Dominion of Canada Nos. 53683, 57344, for improvements in bark cutters; 60313, for improvements in wood sawing machines; 62695, for improvements in bark cutting machines; 64575 for improvements in log thawing machinery; 64893, for improvements in boiler furnaces; 67239, for improvements in machines for removing the bark from slabs of wood; 67751, for improvements in attachments for pulpwood chippers, will apply for a special Act authorizing the Commissioner of Patents to grant a certificate of payment of the further fees required by the Act and an extension of each of the said patents for their full term of eighteen years, and to confirm the said patents.

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CHANGES AT THE CANADA COATING MILLS.

It is announced that Mr. Archibald M. Huestis has been appointed manager of the Canada Coating Mills, Georgetown, Ont. The move is likely to be attended with a large measure of success, Mr. Heustis, who originally came from Halifax, having enjoyed a life-long intimacy with the paper and publishing trades. For the past twenty years he has been head of a department of the Methodist Book Room, Toronto. Among the officers of the company are Robert Kilgour, president; John Waldie, vice-president; Robert Waldie, secretary. The recently appointed superintendent of the mill is Mr. Blanchard. The company is putting in a new set of calender rolls, calculated to increase the output very materially. The product is very fine of its class, and there is no reason why Canada should not be able to supply its own requirements in this class of paper, instead of importing so largely from the other side. Apart from this, no great changes are contemplated by the company, but it is hoped to constantly improve the quality of the paper turned out. It will sell to the wholesalers and jobbers' trade.

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LUMINOUS PAPER.

Luminous paper, or such as gives out a phosphorescent light, exhibits this phenomenon only in a perfectly dark room and after having been exposed to daylight for at least ten hours. Objects covered with this paper, such as candlesticks, match-boxes, etc., can easily be seen in the dark, and figures on a clock face, for example, distinguished; but this is the extent of the lighting capacity. Luminous paper is made with the so-called luminous paints, and the luminous principle of these paints is calcium sulphide or barium sulphide, mixed up with water into a stiff tenacious paste and ground extremely fine between surfaces of unequal hardness. The finished mass should be kept in a vessel with a close cover, to prevent drying. In addition to being very finely pulverised, it is necessary that the paint should be put on in a close, compact coat, with as little as possible of any medium, and that of the very best. The thinner the paint, the more evenly it can be applied; each coat should dry sufficiently to allow the paper to be bent without making cracks in the paint, before the next is put on. The coats should be thin, as they adhere better in this way, and the more uniformly they are applied, the more luminous the paper.

After three or four coats have been put on, the surface is subjected to very strong pressure, to close up any interstices. Isinglass is the best binding agent. To make the coating less susceptible to dampness, it is spread over, when still moist, with a dilute solution of potassium chromate, and exposed to direct sunlight. The paint is made by grinding with glue water, so that with ten parts a coat from 1 to 1½mm. thick is obtained after about thirty applications. The process of manipulation is slow and detailed, but the results are worth the trouble involved. A surface thus prepared will be luminous in the dark in thirty hours after being exposed to light.

Paper is used as the foundation for all purposes. Japanese tissue paper and copying paper are best, but they must be handled carefully, as the paper is penetrated by the paint, and apt to be sticky on the under side. It may be had in rolls, and cut in any shape or length. The process of preparing these papers is very carefully carried on, and they can be attached equally well to glass or metal.

If the paint is put on in thin coats, up to a thickness of 1 to 1½ mm., the paper will bend without cracking and the paint will not peel off. Care must be taken to dry each coat separately, and to see that the isinglass seems moisture proof, by the use of potassium chromate. The paper must be pressed repeatedly, as long as the layer of paint is at all soft or moist. To make the surface close and compact it is rubbed, after it is firm enough, with some of the liquid paint and isinglass and a burnishing agate, and after drying it will appear smooth and shining.

Unsatisfactory results in the past have been due to neglect of the details of the process; if these are duly carried out, a luminous paint is obtained which after exposure to direct sunlight, will give sufficient light to enable a person to tell the time upon a watch brought near to it. The best quality of gelatine can be used instead of isinglass.

The luminous mass consists of four parts of potassium bichromate, four of gelatine, and fifty of calcium sulphide. The constituents are ground together in a perfectly dry state, to make an intimate mixture. One part of this is then stirred up with three parts of hot water, making a thick mass, ready for use. The paint is put on to the paper or cardboard with a brush, in the ordinary way, and is weatherproof after drying. But if nothing further were done, it would almost inevitably be the case that the thicknes of the paint, and consequently the luminosity, would be unequal. To remedy this, the sheet is passed through rollers so arranged that the layer of paint is pressed out into absolute evenness. In place of the method above described, a solution of glue may be applied to the paper with a brush or by means of rolling or pressing; it is then sprinkled over with powdered calcium sulphide and pressed to make the luminous layer even. If the glutinous solution is put on in figures, etc., the powder will, of course, adhere only to these places.

The following composition will produce a waterproof paper which will retain its luminous property for many months:

40 parts of dry paper stuff.
100 parts of water.
10 parts of phosphorescent powder
1 part of gelatine.
1 part of bichromate of potassium

Mix the components and make into paper in the usual way.

LOWERING THE BEATER ROLL.

The lowering of the beater roll is, or should be, a very delicate operation, to suit the humor of the pulp as it passes from half-stuff to beaten stuff, says a writer in "Paper-Making." The roll, as we know, in the ordinary way is periodically and spasmodically lowered. Each lowering adds to the power consumption. Dynamometer diagrams on hollanders and Umpherston and Taylor beaters have proved to us that the consumption of power is dependent more upon the position of the roll in relation to that of the bed-plate than upon the exact condition of the stuff at the time. This is not always realized by beatermen· A man may look at a beater of stuff and say, "That stuff is strong and will require a lot of power to beat." We would rather say, "We shall have to make the beaters consume a lot of water to get that stuff off." The beaterman's great object, of course, must be to beat the stuff to give the proper effect on the machine. The question of power is not as a rule considered, simply because the beaterman is hauled over the coals for getting the stuff too long or too wet for the machine, but nothing is said or known if he uses five or ten tons a week more coals than he need do.

If each beater had attached a dynamometer or some such contrivance that would indicate the absorption of power, or better still, register on a dial what power had been absorbed throughout the treatment, the manager could see for himself what had been done at any time of the day or night. He could ascertain by comparison of such diagrams, just how to lower the roll so as to get the stuff off not only to suit the machine and the class of paper required, but to save considerably on his coal bill.

On a visit to one of the best mills in the United States producing short fibred soda wood pulp for the manufacture of high-class printings, the proprietor showed the writer a room which might be described as a "chart room," in which were a number of self-recording instruments, resembling self-recording barometers, which instead of recording the pressure of the atmosphere, indicated the pressure in each of the digesters. By means of these curves he could ascertain whether the men in charge of the digesters had done their work properly. The room was under lock and key not available to the men. Whatever they did was faithfully recorded upon the chart. They had instructions to produce a certain curve; when they did so, the result was eminently satisfactory. Thus a complete tally of the work of each man could be kept, and the manager be better acquainted with the manner in which the boiling had been conducted on examining the charts the next morning than if he had stood by the men the whole time. The same modus operandi might some day be applied to the beater.

The possibility of automatically lowering the beater roll, was taken up by Mr. A. D. Little, the well-known American chemist, and he communicated a plan by which this might be accomplished, together with a drawing and full description of the attachment. The idea of the attachment was to automatically reduce the space between the fly bars and the bed plate by an arrangement consisting of a gear which, when started, could be left going, and so timed that the roll was full down at the right time. The view then held was that the roll requires to come nearer and nearer to the bed plate, not by one or two turns every half hour, but perpetually. The views generally held by the most expert men in the trade are that the beaterman is not a mere machine which brings together the roll and bed plate mechanically, but that he requires to humor his stuff from time to time, especially in mills where great variety of materials are under treatment, and where the beating has to be controlled to suit each quality and substance of paper.

Furthermore, notably in rag mills, there are between 20 and 30 different qualities of rags, each requiring different treatment, and these when mixed together or treated separately in the beater go to produce perhaps a hundred different kinds and substances of paper, each of which the beaterman has to study. In addition to this, there are further uncertainties, as, for instance, in one particular quality of rag (let us say "super-tender," or "best super," which are not always exactly the same thing from one boiling to another). It is no doubt the intention of the papermaker that they should be so, but they are picked from rags coming from different merchants, sometimes from home rags and sometimes from continental, sometimes they are used soon after boiling, while others are stored away after boiling or bleaching, and they are consequently more or less tendered according to circumstances. It would be impossible, therefore, to lay down a cast-iron formula in regard to the exact position that the rolls should occupy at every stage of the beating. An intelligent beaterman must feel his way; the humoring of the stuff becomes instinctive, and no mechanical contrivance can display sufficient humor and intelligence, however ingeniously worked out, to provide for all these contingencies.

On the other hand, it was pointed out that with certain classes of paper, dealing with regular qualities of material, where few changes were made, such a mechanical contrivance, when once put into operation, might be worked in a satisfactory manner—as, for instance, it might work in a mill beating for "news."

In further complication of this subject, the fact has to be considered that even in the ordinary hollander, the details of which are more or less stereotyped, the condition of the bars varies from time to time, as they get blunted, and the treatment which would do for bars recently sharpened would not hold good with the bars becoming worn. Furthermore, the treatment that would have to be accorded to a hollander would not hold good for another form of beater, a change in roll or bed-plate as to number of bars, angle, etc., would again affect the question. Each class would have to be manipulated in a different manner; hence all sorts of difficulties present themselves, and for the time being we are obliged to dismiss the idea for any automatic contrivance for the lowering of the beater roll, which attempts to do away with the personal equation of the beaterman.

Tenders for Pulpwood Concession.

Tenders will be received by the undersigned, up to and including the eighth day of March next, for the right to cut the Pulpwood on a certain area, in the District of Nipissing, north of the Townships of Holmes, Burt, Eby, Otto, Boston, etc., and immediately west of the interprovincial boundary line.

Tenderers should state the amount they are prepared to pay as Bonus, in addition to such dues as may be fixed, from time to time, for the right to operate a pulp, or pulp and paper industry on the area referred to. Successful Tenderers will be required to erect mills on the territory, or at some other place approved by the Lieutenant-Governor in Council, and to manufacture the wood into pulp in the Province of Ontario.

Parties making tenders will be required to deposit with their tender a marked cheque, payable to the Treasurer of Ontario, for ten per cent. of the amount of their tender, to be forfeited in the event of their not entering into agreement to carry out the conditions, etc. The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital required to be invested, etc., apply to the undersigned.

F. COCHRANE,
Minister of Lands, Forests and Mines.

Toronto, December 29th, 1906.

No unauthorized publication of this notice will be paid for.

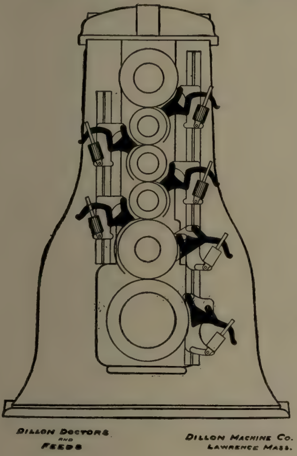
* * *

—In a Montreal fire last month, the premises of the Dreyfus Importing Co., dealers in fancy leathers and bookbinding supplies, were damaged to the amount of $45,000.

DILLON MACHINE CO.

BUILDERS OF

PAPER MILL MACHINERY



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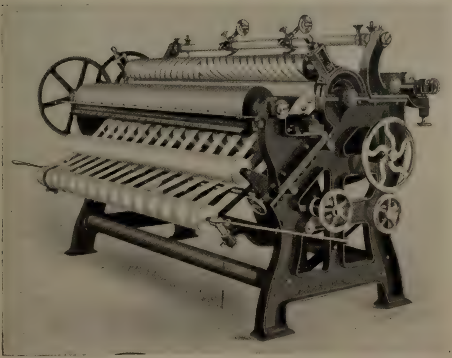
- **Jordan's Three Sizes—Single, Double & Triple**
- **Stuff Pumps, with Dillon Patent Valve Seating**
- **Wet Machines**
- **Horizontal and Vertical Stuff Chests**
- **Single and Double Paper Cutters**
- **Backstands**
- **Plates, Knives and Bars**

**DILLON
PATENT
DOCTORS
AND FEEDS
MADE IN
CANADA
BY THE
SHERBROOKE
IRON WORKS,
SHERBROOKE, P.Q.**



LAWRENCE, MASS., U.S. A

PAPER SIZE.

A new process for making size for paper has been patented by Dr. Alexander Mitscherlich, of Freiburg, in Baden. It consists in mixing waste sulphite lyes, which contain sodium sulphate to prevent any injurious effect from the lime, with a solution of rosin and horn, obtained by dissolving horn in rosin size, below 100° C, the latter being made with an excess of soda. The process is carried out as follows:

A small portion of the rosin to be used is boiled, stirring, with the whole quantity of soda (about 17½ per cent. of the rosin), to rosin size. To the solution the horn is added, in the form of thin pieces or shavings, in the proportion of about one-fifth part of the whole quantity of rosin. It will dissolve completely, at a temperature below 100° C., in about 48 hours, large pieces taking longer. It should be stirred occasionally. For the purpose of bleaching the rosin, as well as to produce a size which will be as clear as possible, and remain so during boiling, and also to destroy the effect of any hydrogen sulphide which may be developed from the horn. Sulphurous acids are employed, either alone or in the compounds, during the addition of the horn and afterwards. Then the remainder of the rosin is introduced, and is quickly and completely dissolved.

The horn, for good sizing, which will hold the paper fibres firmly, must be mixed with sulphite lyes, in order that a leather-like precipitate of keratin (horny substance) with the tannic acid of the lyes, may be effected in the paper pulp by means of acids or aluminium sulphate, simultaneously with the separation of the rosin; whereby the excellent qualities of the sizing are brought out. A previous addition of the waste lye to the fluids, as was formerly the custom, is not advisable, since the lye receives from it a dark color, difficult to get rid of.

After the horn and rosin are completely dissolved, sulphite waste lyes, as clear as possible, are introduced, with stirring, in sufficient quantity to cause precipitation in a test tube with carpenters' glue. The required quantity is usually about four times the quantity of the horn. The lye must be evaporated correspondingly to the concentration desired in the size. It need not be freed from lime or magnesia, by means of soda, as was formerly customary, but is brought into solution, after evaporating one-third, with sodium sulphate, in order to combine the greater portion of the lime with sulphuric acid.

The quantity of sodium sulphate required varies according to the composition of the lye, that is, its contents of lime and magnesia. As a rule, 2 kilogrammes of dry sodium sulphate are sufficient for 1 hectolitre of lye. If the solution is heated, there will usually be a precipitate, which will dissolve on cooling.

It is advisable to add to the waste lyes of the manufacture of sulphite cellulose, during evaporation very small quantities of soda—nearly to the point of a neutral reaction—in order to prevent the escape of sulphurous acids. A large amount of soda would be harmful, by causing a brown color, difficult to remove.

* * *

—Manufacturers of blotting paper in the United States have advanced prices ¼c., in an effort to partially cover the increased cost of material and labor.

—Many rumors are going around in regard to the disposition of the works of the William Hamilton Mfg. Co., now in liquidation. The Canadian General Electric Company and the Allis-Chalmers-Bullock Company are both credited with the intention of taking over the plant if possible. In the event of the latter Montreal concern taking over the works, it would continue the water wheel and saw-mill machinery busines of the Peterboro' concern, and woul also transfer several other department to this western plant in order to make more room at its present factory.

EMERSON MFG. CO.

Jordan
Press Rolls
Plates
Wet Machines
Engines
Cylinder Machines
Cylinder Washers
Engine
Avenues of Our Success.
EMERSON
All Work Guaranteed.
Bars
Fourdrinier Machines
Stuff Chests
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Bed
Filling for all styles of Jordans
Engines

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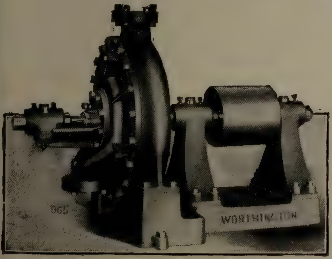
The John McDougall Caledonian Iron Works, Limited

MONTREAL, P.Q.



Worthington Turbine Fire Pump, working pressure 160 lbs.

BOILERS:

Return Tubular "McDougall"
Water Tube, Lancashire, etc.

TANKS:

Water Tanks, Penstocks, Steel Riveted Pipe, etc.

MACHINERY:

Complete Power Plants designed and installed.

Sole Manufacturers in Canada for Worthington Turbine Pumps. "Doble" Impulse Water Wheels and New York Filter Co.'s Pressure Filter.

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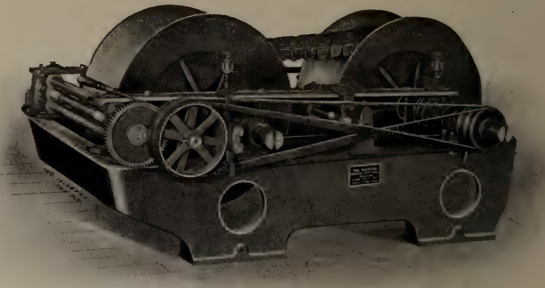

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Variable Speed Transmission

The one practical device for regulating the speed of the paper machine.

It everlastingly gets away from the nerve racking old true cone, in whatever form it seeks to disguise itself.

There is absolutely no shifting of belt.

It is made in sizes to drive anything from a winder to a 140" Fourdrinier.

Any speed within its extreme range of variation may be instantly secured and the changes effected without breaking or stopping the paper sheet.

Recommended and adopted by the largest and most progressive paper mills in America and Europe.

Send for Paper Machinery Catalogue To=day

REEVES PULLEY COMPANY,

COLUMBUS, INDIANA, U.S.A.

German Grindstones

Wood Grindstones,

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Artificial Emery and Quarzstones

Stones of all kinds used in Wood Pulp and Paper Manufactories.

Six Own Quarries at
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GEBRÜDER ISRAEL

PIRNA-ON-THE-ELBE (SAXONY)

Oldest Factory for Wood Grindstones in Germany. Established 1866.

The Moreau Pulpwood Barker

Capacity, 3 Cords per hour with 2 men and 6 horse power.

It can be run the year round in dry, green or frozen wood.

The Real Machine which takes only 16 to 18 per cent. discount of the wood and saves money.

WRITE TO-DAY FOR FURTHER PARTICULARS.

The Moreau Barking Machine Co., Ltd.

C. MANSEAU, Selling Agent for U.S. and Canada, Mitchell, Quebec.

RELIABLE AGENTS WANTED.

PULP STONES

ENGLISH, GERMAN and SCANDINAVIAN

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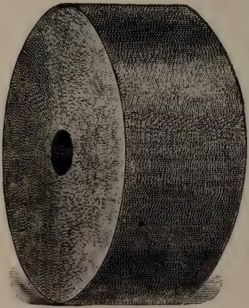
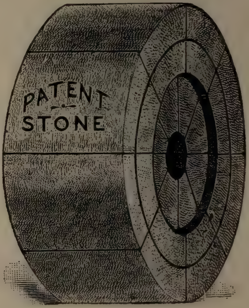




the construction of which gives to it advantages not found in the one piece stone.

Let us tell you about them

JEAN FREESE

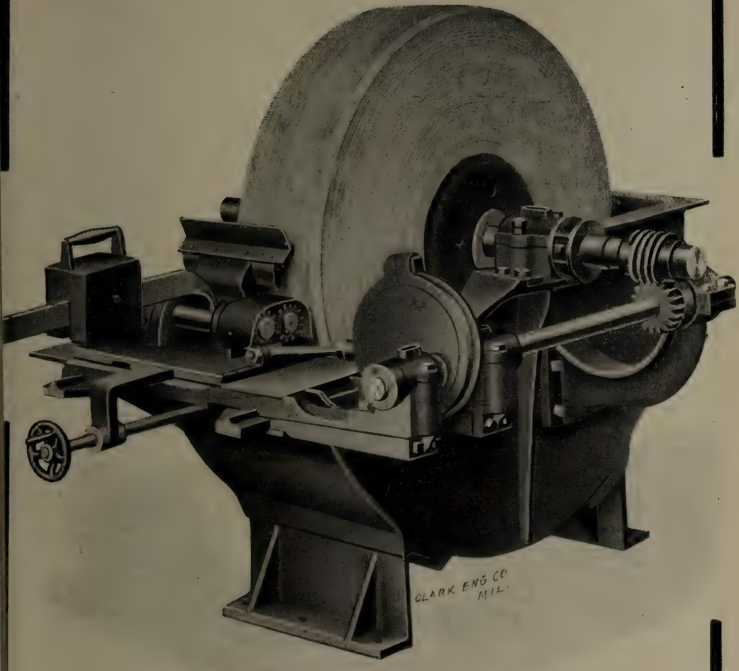
132 NASSAU ST., NEW YORK, U.S.A

—Manufacturers of brown wrapping papers in England have advanced prices, owing to scarcity and high cost of raw material.

—The plant and premises of the Capital Printing Company, Saskatoon, Sask., were on the 8th inst., destroyed by fire at a heavy loss, partially insured.

Valley Iron Works Co.,

Paper & Pulp Mill Machinery Specialists



AUTOMATIC BARKER KNIFE GRINDER.

This machine has a capacity of 150 perfectly ground knives per day, and does not draw the temper of the knife—therefore effects a saving in your knife account. It is the only machine of its kind on the market.

WRITE US FOR PRICES.

Valley Iron Works Co., Appleton, Wis.,

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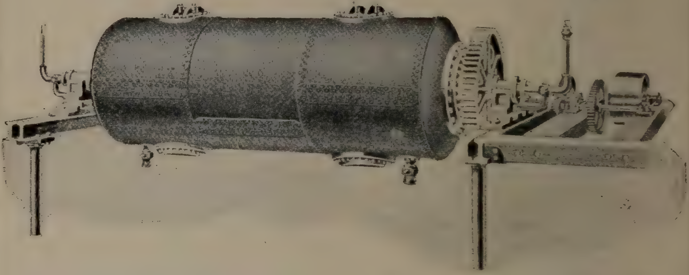
Holyoke Steam Boiler Works,

INCORPORATED **HOLYOKE, MASS., U.S.A.** T. H. SEARS, Mgr.

MANUFACTURERS OF

EXTENSION FURNACES, HIGH PRESSURE HORIZONTAL TUBULAR BOILERS, IMPROVED DIGESTER, IMPROVED VERTICAL BOILERS.

Improved Rotary Bleach Boilers.



This cut illustrates our improved rotary bleach boiler the result of more than 30 years careful study and experience. The most complete of its kind in the world. Over 500 in use in Canada, United States and Mexico

We are specialists in boilers and furnaces for pulp and paper mills. Let us know your requirements.

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The OLDEST & LARGEST MANUFACTURERS of **DANDY ROLLS** IN THE WORLD.

BANK NOTE MOULDS, DECKLE STRAPS, CUTTING MACHINES, ANIMAL SIZING MACHINES, PATENT DANDY ROLL CARRIAGES, PAPER TESTING MACHINES, PAPER SCALES, &c.

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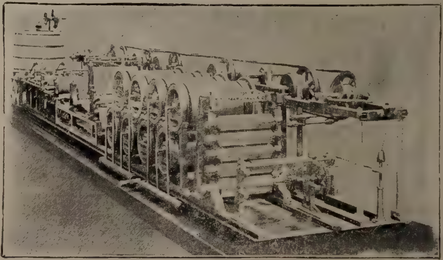

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Specially constructed for Mill Testings before Making the bulk, the same results being obtained as from a wide Fourdrinier Machine. Also for Technical Instruction.

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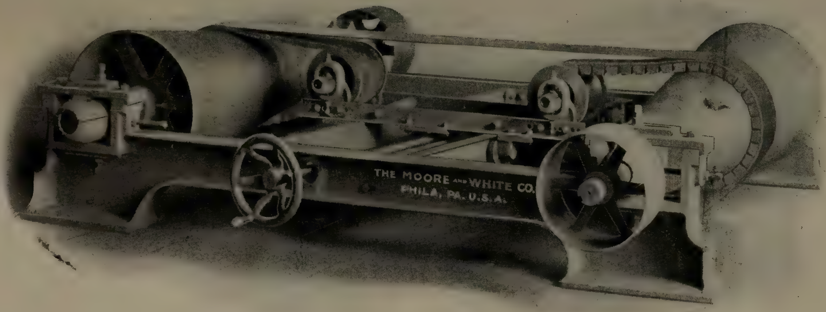

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ANY DESIRED RATIO OF CHANGE.

Absolutely No End Thrust or Tendency Sidewise of Transformers or Driving Belt.

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BUILDERS OF PAPER MAKING MACHINERY

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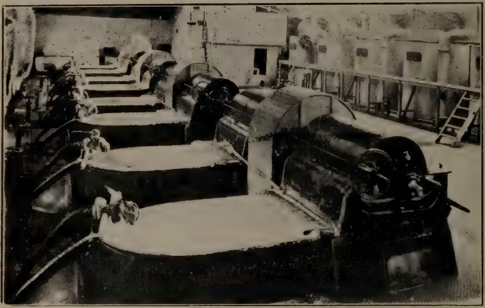
Paper-Makers' Engineers



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500 Twelve-Foot Logs per Hour

Cut into two-foot lengths ready for the barker. That is the ordinary capacity of

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(Patented in United States and Canada, 1900 and 1906.)

One man alone operating the machine can cut 5,000 logs every ten hours without much exertion. Logs automatically conveyed to the saws, and from the saws to the barker. A machine installed in the large No. 2 mill of the Chicoutimi Pulp Co. and operating 10 hours per day

Supplies Wood to Twenty Grinders Working 24 Consecutive Hours.

On account of its many advantages, and the fact that it requires only one man to operate, our machine has replaced expensive systems requiring the services of 18 to 20 men.

ECONOMISE IN YOUR WAGES BILLS, INCREASE YOUR PRODUCTION, AND SWELL YOUR PROFITS.

This can only be done in the pulp mill by the use of our up-to-date sawing system' Write to-day for catalogue and particulars.

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Patentees and Sole Manufacturers.

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Manufacturers of High Grade Easy Bleaching

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Suitable for Writing and Book Papers

St. John Pulp and Paper Company,

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Quality equal to best imported Norwegian Stock.
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Machinery for Paper Mills and Pulp Mills

REPRESENTED BY

THE WM. HAMILTON MFG. CO., LTD.,

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Who are prepared to Build in Canada the Inventions
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Under Numbers 68,093, 71,746, 72,118, 77,818, 89,114, 89,115;

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Pulping Engines and Kneaders

OVER 200 SOLD

FOR PULPING-UP

Dry Wood Pulp, Machine "Broke," Old Paper Stock, Waste Papers.

MADE IN THREE SIZES TO PULP THREE, SIX AND NINE TONS DRY WOOD PULP IN TWENTY-FOUR HOURS. — FIVE, EIGHT AND TWELVE HORSE POWER REQUIRED.

£125, £150 and £200 c.i.f. U.K. Ports.

Beaters and Edge Runners can be filled in from one to two minutes if the pulp is first disintegrated by one of the Wurster Engines, while the output is larger with the same power. These Engines do four times the work of stones, and neither shorten, affect, crease, or wet the fibre in any way, nor change the color or the sizing. They can also be used for Kneading Clay and other Fillers, and Bleaching Powder.

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DR. C. WURSTER, 29 Abbey Road, St. John's Wood, LONDON, N. W.

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POSITION WANTED.

A mill manager, having experience in the manufacture of Kraft Brown both in Sweden and England, is open for an engagement with a Canadian mill. Is able to take charge of a paper mill as manager or assistant manager. Address "Kraft,' c/o Pulp and Paper Magazine.

FOR SALE

Cylinder Paper Machine, 72 inches wide, complete from screen to winder, including steam engine, all shafting and pulleys. Reason for selling, replacing by a larger machine. Will sell cheap to prompt buyer. Apply to "Paper Manufacturer," care Pulp and Paper Magazine, Toronto. Canada.

PULP AND PAPER MARKETS.

Toronto, January 12th, 1907.

Since our last report, market conditions have become still firmer, though around holiday time business fell off a little, as is generally to be expected. Since the turn of the year no complaint has been heard, and "news" has been particularly active. Wrapping is meeting a fair demand, but nothing phenomenal. The water conditions in most parts of Ontario are now fairly good, especially north of Lake Huron. In Quebec, too, they are fairly good. However, not all the mills either in Ontario or Quebec are fully supplied with water, and in several some of the machinery is still idle.

Prices for ground wood are about $14 at the mill, or $25 delivered, while sulphite is quoted at $38 to $40 in Canada, and sometimes materially more, delivered in the United States. Demand for all classes of pulp and paper is keen, and as pulp continues scarce, this is likely to become accentuated.

Large sulphite manufacturers in Europe are advancing prices. English reports say there is a much firmer feeling in the latter, while soda pulp is scarce and high.

The demand for chemicals is a little easier. Bleaching powder is firm. Ammonia alkali is quoted at £4.10 to £4.15 for 58 per cent. Caustic soda, 76-77 per cent. at £10 12s. 6d. Recovered sulphur at £5.

THE UNITED WIRE WORKS LTD.
Edinburgh, Glasgow & Newcastle on Tyne.
FOURDRINIER WIRES
CYLINDER WIRES
Wire Cloth all meshes, in Brass, Copper Bronze & Steel.
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Wires held in stock at Montreal for prompt delivery.

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MINES—Ruddle, Bojea, Colchester, South Ninestones, Tronance, St. Austell, Cornwall.

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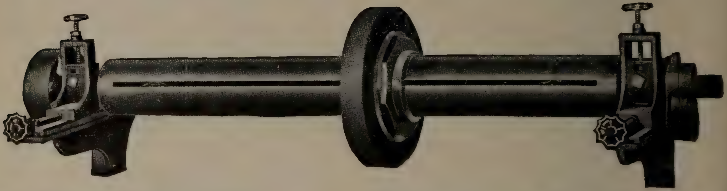

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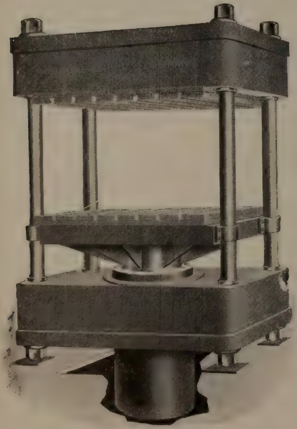
PRESSES, HYDRAULIC or KNUCKLE JOINT



Heavy Duty Pulp and Baling Presses.

WILLIAM R. PERRIN & COMPANY, Limited,
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Paper Machines,
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Boilers,
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Dryers, Calenders,
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PULP and PAPER MILL EXPERTS,
PULP AGENTS and
EXPERIENCED "PULP" ARBITRATORS
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THE RIORDON PAPER MILLS,
Limited.
Merritton and Hawkesbury, Ont.
Merritton Mill—Newspaper, Hanging Paper, Wrapping Paper and Building Paper and Sulphite Pulp.
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THE UNION SULPHUR COMPANY
PRODUCERS OF THE HIGHEST GRADE BRIMSTONE ON THE MARKET.
AVERAGE ANALYSIS: { Sulphur, ... 99.9 per cent.
Organic matter, .1 per cent.
Absolutely free from Arsenic, Selenium or Tellurium.
The Largest Sulphur Mine in the World.
CALCASIEU PARISH, - LOUISIANA.
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Builders of the highest grade of Paper Finishing Machinery, Rag Dusters, Belt Power Elevators, etc. Contractors for Filter Plants of any size, Industrial or Municipal, Gravity or Pressure system.

Contractors to
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Nothing better in this class of Belting can be had, and it is specially recommended for heavy and difficult drives. Everything in connection with this Belting is of the very best quality

IT STRETCHES LESS THAN ANY OTHER BALATA BELTING.
and is without doubt the most reliable of its kind.

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MACHINE KNIVES
Of Every Description.

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DEALERS IN
Paper and Pulp of All Kinds.
Prices and Samples on Application.

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CHINA CLAY IMPORTERS,
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Sole Agents for the .. .. L.G.V., W.F., ◇K◇ and other Brands of

CHINA CLAY.

L. G. V. is a natural Pure White, free from any artificial tinting.
For Coating, Bleaching or Fine Papers it is unsurpassed.

ESTABLISHED 1878

George E. Hanson

Expert Manufacturer of High-Class

FELTS

FOR SULPHITE AND GROUND WOOD PULP MILLS

Only best of stock is used in making these goods. I am supplying some of the best Mills in Canada, among them being, The E. B. Eddy Co., Hull; J. R. Booth, Ottawa; James Maclaren Co., Buckingham, Que.; Nova Scotia Pulp Co., N.S.; Lake Megantic Pulp Co., Lake Megantic, Que.; A. J. Morrill, Nicolet Falls, and others.

A trial order would be appreciated.

HULL WOOLEN MILLS, HULL, P.Q.

STUFF PUMP

This pump is made in three sizes, 5″, 6″ and 8″.

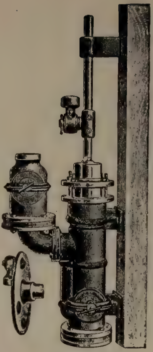
The valves are made so as to be easily and cheaply replaced and can be got at without using wrench.

We also make boiler feed and other pumps.

Particulars and references on request.

Manufactured by

T. McOUAT & SON, Lachute, Que.



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BELTING
DOMINION BELTING CO. LTD.
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J. R. Walker & Co. Importers and Packers of **GRADED RAGS, PAPER STOCK, ROPE BAGGING, ETC.**

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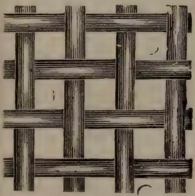

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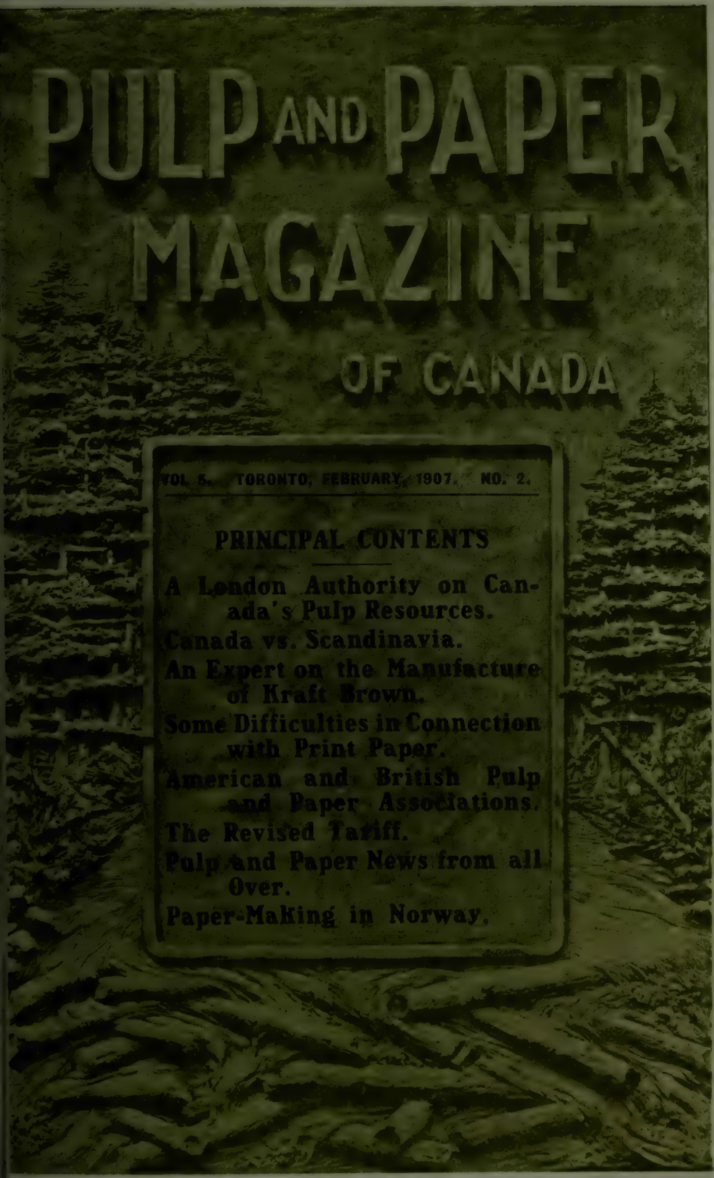

PULP AND PAPER MAGAZINE OF CANADA

VOL 5. TORONTO, FEBRUARY, 1907. NO. 2.

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Canada vs. Scandinavia.

An Expert on the Manufacture of Kraft Brown.

Some Difficulties in Connection with Print Paper.

American and British Pulp and Paper Associations.

The Revised Tariff.

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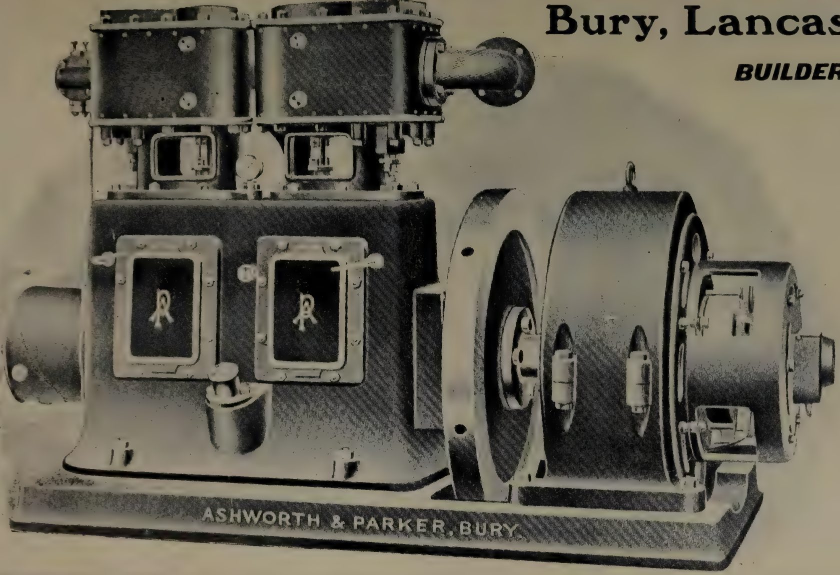

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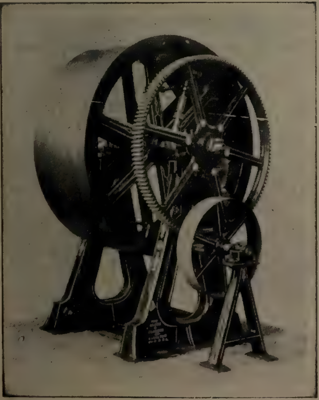

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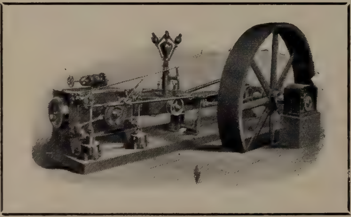

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THE
PULP AND PAPER MAGAZINE
OF CANADA

VOL. 5.—NO. 2. TORONTO, FEBRUARY, 1907. $1 A YEAR
SINGLE COPY 10C.

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade.

SUBSCRIPTIONS: Canada, British Empire and the United States, $1 a year; to Foreign Countries, 5s. a year.

BIGGAR-WILSON, Ltd.,
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OFFICES, CONFEDERATION LIFE BUILDING,
TORONTO, CANADA.

The business heretofore carried on by the present publisher has been turned into a joint stock company, under the style of Biggar-Wilson, Limited, with E. B. Biggar as President, and F. Page Wilson as Vice-President.

A LONDON OPINION OF CANADA'S PULP RESOURCES.

The London "Financier" has for some time past been devoting special attention to Canada and the great opportunities it presents for investment. Two articles were devoted to the pulp and paper industries, the first being a preliminary or historical survey. The writer starts as follows:

"The resources of Canada in those especial kinds of wood from which paper pulp is made are, by general consent, considered to be the greatest in the world. Sweden and Norway and one or two other European countries, and several of the great forested States of the American Union are rich in pulpwood, but for the most part their resources have been attacked in the past with such unscrupulous vigor and with so little regard to reserves for future use that the forest resources of those countries suitable for pulp manufacturing purposes are becoming rapidly reduced, notwithstanding the efforts of the various Governments to conserve for future use the remnants of what were, in most cases, magnificent heritages, wantonly destroyed. The progress of ruthless destruction in Canada was wisely arrested in time, and the exploitation of the resources of the Dominion in pulpwood has been conducted for the most part on scientific principles, which, while providing the most ample facilities for the utilisation of available material suitable for conversion into wood pulp, has also provided for the absolute conservation of what it would have been unnecessary, if not useless, to cut down, merely for the purpose of swelling current supplies of pulpwood. Hence," says the English financial authority, "with its practically illimitable forest resources, rich in pulp woods, exploited under stringent Government regulations, which provide for their proper conservation, Canada now presents itself as the field to which the world must mainly look for a sustained supply of pulpwood in the future."

Further, he says, in speaking of Canada in comparison with other countries: "When placed alongside of other pulpwood-producing countries, Canada alone seems to emerge from the ordeal of comparison free from restrictive computations. The United States, Norway and Sweden chiefly, and a few other countries in lesser degree, have still resources at their disposal in pulpwood forests but it seems beyond question that, owing to the causes at which I have already hinted, the limit of their productive capacity in pulpwood is within measurable distance, especially when one regards them in this particular from the point of view of international competition and market exigencies."

So much for Canada's future as a pulpwood producer. When it comes to what this country has accomplished and is accomplishing at present, in the way of utilizing its admittedly immense resources, the "Financier" is not so complimentary. It thinks Canada, considering her great possibilities for the manufacture of pulp, ought to be exporting to the United Kingdom much more of that article than it actually does as yet. Norway and Sweden are both away ahead in this respect. "But," adds the "Financier" "what Canada loses as an exporter of raw material she gains to some extent as an exporter to us of the finished material in the shape of unprinted paper, almost wholly news." The sum total of its deliberations on this subject is that Canada contains, beyond all question, the greatest resources in pulpwood forests in the world, and that it possesses a virtual prospective monopoly in the supply of wood pulp for paper-making purposes.

NEW BRUNSWICK FORESTRY CONVENTION.

No better place for the holding of an important gathering of those interested in forestry could well be chosen than Fredericton, where the New Brunswick convention takes place on the 20th and 21st inst. Fredericton is the capital of a province of which its forests are its chief and most valuable asset. Its annual income for lumber is large even now, but conditions are taking more definite shape every year under which this must greatly increase in the near future. This is a matter which concerns not only lumbermen, but practically every resident of the Province. It has been stated by someone that Canada, if she cares properly for her interests now, will be in a position almost to corner the world's market and name her own prices. We credit New Brunswick with a wider outlook than to have any particular desire to corner the market; still there is no reason whatever why it should not reap the full advantage of the resources which nature has lavished upon her.

CANADA VS. SCANDINAVIA.

Some time ago an English paper put forward the claim that Norwegian spruce was superior to anything else for pulp making purposes in the world, and since then a sporadic discussion has been taking place on the question. Without a doubt, the position was ill taken, for the concensus of opinion not only in this country, but in England, and in fact wherever the comparative merits of pulpwood are in a position to be judged, is that the Canadian spruce is superior, or at the very least that it is unsurpassed. As a matter of fact, climate and topography of the spruce-growing regions of the two countries are such as to render their respective growths very similar. It is true there is somewhat more resin present in Canadian spruce, but this makes little difference if as good a fibre can be produced. In this respect the Canadian wood can and does amply justify itself. Most of the contracts made abroad give the option for either Canadian or Norwegian spruce to be supplied, which is evidence enough that Canadian pulp is not regarded as inferior. Indeed, many of the old country manufacturers prefer the Canadian.

But the result of a recent actual test should set the matter at rest for all time. Lloyd's, of London, sent a shipment of Canadian wood over to their Norwegian ground wood mills, and made a pulp out of it fully equal to what they make out of Norwegian wood. They did this because Norwegian ground wood was claimed, on the whole, to be somewhat better than the Canadian, and they wished to find out whether it was due to the wood or to the process. They demonstrated to their own satisfaction that it was not due to the wood.

⁂

RESIGNATION OF E. STEWART.

E. Stewart has resigned the position of Dominion Superintendent of Forestry, in which he was able to do such good service for the conservation of this country's wood resources. He was one of the first to recognize or at least to bring to the front in public discussion in Canada, the fact that timber is a crop, to be cut when mature and to be allowed to reproduce itself. He organized the Dominion Government's Forestry Service, became superintendent in 1899, and has done much to educate public opinion in the matter. At his instigation there is now on foot an important and active tree-planting propaganda in the Canadian West.

Mr. Stewart was originally a resident of Collingwood, and was a land surveyor and engineer. It is understood he resigns to become associated with a large lumber company in British Columbia.

PULP AND PAPER NEWS

The St. Raymond Paper Co. is making good progress with its new mill. We hope to be in a position to give fuller particulars shortly.

The Laurentide Paper Co. has declared a dividend of 3 per cent. on its common stock for the half-year ending December 31st.

The Hitchings Paper Box Co. have established a factory in North Winnipeg for the manufacture of plain, fancy and folding paper boxes.

A. Connors, of Windsor Mills, Que., had three of his fingers cut off while working in the Canada Paper Co.'s mill at Springvale.

W. F. Sears, Frost Village, Que, recently had two bones in his foot broken through a 75-pound stick of pulpwood falling upon him.

The Monarch Lumber Co. has been incorporated in British Columbia with a capital of $50,000. It will manufacture and deal in lumber, pulp-wood, etc.

The Dominion Paper Mills on Nicolet River, Quebec, are now operating new paper machines, with a capacity of 15 tons daily.

E. J. Parker, outside man of the Chatham Pulp Co., is visiting this week operations on the company's land at Black Brook and Tabusintac.—St. John Sun, Jan. 28.

The Spanish River Pulp and Paper Co.'s mill at Espanola, Ont., of which A. E. Millington is manager, is now operating 24 grinders and turning out 135 tons of pulp per day, its full capacity.

Employees at J. R. Booth's paper mills, who have been paid at the rate of $1.50 to $3 per day, are asking that their wages shall be increased by 25 per cent. or their hours reduced from twelve to eight.

The Muirhead & Mann Lumber Co., Limited, capital $60,000, is empowered, among other things, to manufacture and deal in pulp, lumber, etc. It will carry on the business of Muirhead & Mann in Victoria.

Preparations are now being made in Pittsburg for shipping speedily the large quantities of steel material required in the construction of the Harmsworth pulp and paper mills in Newfoundland.

Bentley & Jackson, Ltd., of Bury, Eng., makers of patent refining engines, rag cutters, self-contained pillar pumps for stuff water, etc., are extremely busy with orders. They have recently enlarged their works.

The Robitaille timber limits at Cascapedia, Que., have been bought by Senator Edwards, we understand, for $400,000. The limits consist of 373 square miles. The price paid by L. A. Robitaille in 1872 was $8 per mile.

The business of Ashworth & Parker, engineers, Bury, England, has grown so rapidly in recent years that the firm has taken into partnership F. O. L. Chorlton, formerly a manager of Mather & Platt's Iron Works, at Salford.

The Canada Pacific Sulphite Pulp Co. is asking the courts to confirm its recently passed resolution to acquire and use all the rights and privileges of a power company under the British Columbia Water Clauses Consolidation Act.

In consequence of the rapidly increasing price of resin and the uneasiness caused thereby in the European paper trades, the German Cellstuff and Paper Chemists' Association offer a liberal reward to the inventor of a successful substitute.

The Continental Timber Co., Limited, Toronto, in which D. A. Brebner, J. Leith Ross and A. W. Holmested, of Toronto, are interested, has been granted an Ontario charter. It will manufacture and deal in lumber, pulp and paper.

Masson, Scott & Co., Ltd., of Fulham, Eng., find a keen demand for their patent bleaching towers, owing to the saving which is effected in bleach. The company has been giving great attention lately to water softening plants in connection with mill effluents.

The Burrard Lumber Co., Limited, has been granted a British Columbia charter, empowering it to carry on business in that Province and throughout the Dominion of Canada as pulp and paper manufacturers, lumbermen, etc. Capital stock is placed at $150,000.

An association has been organized under the name of the Booksellers' and Stationers' Association of Ontario, composed of representatives of the trade from all parts of the Province. W. Tyrrell, Toronto, is president, and A. G. Cloke, Hamilton, vice-president.

In connection with the erection of pulp and paper mills at La Tuque, Que., it should be stated that the price of the Breakey timber limits was $251,000; the lands were sold at $3 per acre and the water-power for $75,000. We understand that Mr. Weldon, of Quebec, who assisted in promoting the enterprise, has no further interest therein.

Archibald M. Huestis, to whose appointment as manager of the Canada Coating Mills, Georgetown, we referred last month, was, before leaving, presented by the staff of the Methodist Book Room, Toronto, with a handsome club bag.

Cameron & Co., Ottawa, timber merchants, have been converted into a joint stock company, with power to manufacture pulp wood, etc. Capital stock is $100,000. The provisional directors include W. A. and R. G. Cameron, Ottawa; J. A. Cameron, of Rockland, Ont., and Hugh McLean, of Buffalo.

The estate of the late Samuel R. Woodruff, owners of the Lincoln Paper Mills, St. Catharines, Ont., has won in the contention that securities held in a foreign country did not come within the meaning of the Succession Duties Act, and that the ante-mortem transfer of these duties to various members of his family was valid.

The British America Pulp, Paper and Railway Co. is asking for an enlargement of time in which to complete its railway and branch lines, and for power to extend the same to Montreal towards the South and to the mouth of the Saguenay River towards the East, also to increase the bonded privileges and issue preferred stock.

The suit brought by Onderkirk & Snyder, of Herkimer, against the Baylis Pulp and Paper Co., Birmingham, to which we have referred before, and in which over $1,000,000 worth of lumber in Canada is involved, is now being heard at Syracuse. John McLennan, of Syracuse, N.Y., as agent, sold the stock of the St. Anne Company, Quebec, to the Baylis Pulp and Paper Company. Onderkirk & Snyder claimed that they had an unexpired option on the stock, and that the sale negotiated by Mr. McLennan was not legal, and could not be made. They ask that they be given title to the stock. The Baylis Pulp and Paper Company denies any knowledge of the option for purchase and for improvements on the property of $200,000, and say that Onderkirk & Snyder paid but $200 for their option on the entire property.

T. J. Marshall & Co., of Stoke Newington, London, the well-known dandy-roll manufacturers, whose remarkable miniature paper machine was described in a recent issue, have now completed a miniature beating engine which will take three pounds of dry fibre or rags, and seems to be perfect in its class. T. Allen Marshall is recovering from a severe attack of grippe.

Geo. Christie, Limited, Glasgow, the Fourdrinier wire makers, have just closed a very successful year's business with the Canadian mills, where the strength, smoothness and long life of the wires of their make are fully recognized. Mr. T. L. Paton, of Montreal, their sole agent for Canada, carries a full line of wires in store in Montreal for prompt delivery.

John S. Hughes, of Milton, N.S., owner of the Rapids Falls and Gowie's Falls pulp mills and the Whitehall paper mills, informs us his product of pulp is all sold for months ahead, and that he cannot make it fast enough to fill orders. The mills are favorably situate for the export trade. Work on constructing the paper mill is progressing.

The Prince Rupert's Timber and Lumber Co., Ottawa, capital $400,000, has secured a Dominion charter authorizing it to carry on a lumbering business in all branches, to manufacture pulp, paper and all products of pulpwood. E. H. Moore, G. H. Robertson, and Alex. Fleck, of Ottawa, and F. C. Baker, of Prince Albert, Sask., are charter members.

C. D. Bates and J. A. Innis have bought the Gillies woolen mill in Carleton Place, Ont., formerly owned by the Canada Woolen Mills, and will establish a knitting mill and factory for the manufacture of pulp and paper mill felts. The ratepayers have voted in favor of loaning the parties mentioned the sum of $10,000.

They were formerly with the Penman Manufacturing Co.

Steps are being taken to establish large pulp mills at Natural Steps on the Montmorency River, Quebec. A large dam is being built now, but definite particulars as to the enterprise are not yet forthcoming. Large tracts of spruce exist along the Montmorency River. An electric railroad will be built from the mill to Quebec, also connecting with the Quebec and Lake St. John Railway and the C. P. R.

The affairs of the Imperial Paper Mills were again before the courts last month. One motion was to authorize the receiver to borrow; and another asked the Judge to sanction the appointment of a manager. George Edwards and John Craig have been appointed joint receivers and managers, though they probably will not act before June 1st next. They are authorized to borrow the sum of $40,000.

George F. Hardy, of New York, who is doing the engineering work in connection with the plant of the Anglo-Newfoundland Pulp and Paper Company at Grand Falls, Newfoundland, recently engineered the large pulp and paper mill plant of the Cherry River Paper Company, Richwood, West Virginia, which is said to be the finest in the South. All the machinery for this plant, including the steam engines, was supplied by the Moore & White Company, of Philadelphia, manufacturers of Fourdrinier and cylinder paper machines and speed changes.

On the 11th ult. the officials and staff of Harry B. Wood, Limited, dealers in wood pulp, chemicals, etc., Manchester, were entertained for the second time by the managing director at the Midland Hotel, the repast being served in the characteristic manner for which it is justly celebrated. After dinner a couple of hours were most enjoyably spent witnessing the humorous performance of the "Follies," who are amusing large audiences in the Midland Theatre with a new and vivacious entertainment Later, the social function was resumed and continued "anent the wee, sma' hours," when the proceedings terminated amid general expressions of pleasure and gratification.

The beating engines built by the Valley Iron Works Co., of Appleton, Wis., containing a number of new and patented features have won a great place with paper manufacturers. Orders for 60 engines have been placed with this company during the past twelve months. The machine is built very heavy and with the single object in view of being able to stand severe duty. Prospective buyers of this class of machinery would do well to investigate the claims made by this company. The Valley Iron Works Co. are also builders of the only Automatic Barker Knife Grinder and Pneumatic Wood Splitter on the market, both of which are gaining steadily in favor. Quite a number of orders for these machines have been received lately.

Of the lamented David N. Bertram, of Bertram's Limited, Edinburgh, who died recently of heart failure, the "World's Paper Trade Review" speaks: He was well-known in paper-making circles for a period of about 30 years, and under his superintendence many new paper mills of great importance have been built and a large number of the highest class of paper-making machines have been supplied which are now successfully at work in the United Kingdom, on the Continent, and in India, China, Japan, Canada and Australia. The deceased also carried through many large contracts for machinery for rubber mills, linoleum mills, condensing plant and shipyard tools, all of which are specialties of Bertrams, Ltd. The deceased was warmly respected by those who knew him intimately. No interruption in the business will occur, though he will be greatly missed. S. Milne, the co-patentee with Mr. Bertram of many highly successful inventions, has for a long time past attended to practical matters, and will continue to do so.

KRAFT BROWN AND ITS ORIGIN

A Few Notes on the Manufacture of the Pulp.

By Fred Fielding, Darwen Paper Co.

(Contributed to the "Pulp and Paper Magazine.")

There are many rumors as to the origin of Kraft Brown. Some say it originated in Germany, but I can safely say it was discovered quite by accident in a well-known Swedish mill. However, as Sweden is most noted for it, and produces the genuine article, there is not the slightest doubt about the honor being due that country. During the ordinary boiling process at the mill one of the boils was found to be spoilt, because the stuff was not boiled into as soft a state as usual. The wood was too raw and hard for making into the ordinary class of paper then being made. Those responsible for it were about to reject the boil, and get rid of it as soon as possible before the head manager should see it. The under-manager decided to put it through the "Kollergangs" and make a wrapping paper out of it if possible so that there should be no waste. The managing director had gone away for a few days, so everything was favorable to the men. Great was their surprise when he returned just as the paper had got nicely running on the machine. He tore a piece off, and was greatly surprised at its strength; and, moreover, it was just the very paper that was wanted on the market. He foresaw a great coup, and called the foremen together and made them own up how it was they were making such a paper. Explanations were given, and pardons granted on condition they went straight off and spoiled a few more boils. This was done, and the process improved upon till at last a stronger paper was obtained. Samples were sent out, and orders came flowing in, thus causing arrangements to be made for a greater production. Kraft brown papers are composed of impure cellulose fibres, on which the undissolved ligno-cellulose acts as a very effective binding material. Chemically and mechanically, the fibres are isolated in such a way as to produce the greatest tenacity and felting power. From this you get a paper of light weight, but very strong. The firm managed to keep the method secret for a few years and made quite a nice little fortune out of it. However, other firms wanted to be in the money-making business; so, by making great promises to the foremen and others, enticed them away, and now quite a good number of mills are making it. Of late there are a great many different grades and imitations of "Kraft Brown" placed upon the market, owing to each mill having its own special method and additions made to cheapen the cost. Kraft is the Swedish name for "strength."

There is not the slightest doubt but that Kraft Brown is taking the place of all grades of wrapping papers. In the near future it will be used exclusively, and ordinary browns will be a thing of the past. Owing to its extreme lightness and great durability it is much cheaper than ordinary browns. Another advantage is that it yields twice the number of sheets of a strength equal to or greater than one sheet of ordinary brown paper. Some people are hard to convince, and simply say, "Ordinary brown paper is cheaper, and is quite good enough for me," not thinking that they can get twice the amount of sheets for just a trifle more money. Several large firms have tried both Kraft and ordinary Browns, and have found out by using Kraft Brown that they save a great amount in their packing account. As I am at present engaged in the manufacture of Kraft Brown it will not do for me to mention much about the manufacture of the paper itself, so I will confine myself to the manufacture of the pulp and the method I used in Scandinavia.

There are two processes of manufacturing the pulp suitable for Kraft paper-making, namely, the soda process and sulphate process.

Soda Process.—The efficiency of this process depends partly upon the direct solvent and saponifying power of the alkali at high temperatures, and partly upon the secondary reactions, by means of which the acid products resulting from the resolution of the wood have been brought into the liquid as salts of soda. On account of the great solvent power of the alkaline solution comparatively little pains are necessary in the preparation of the wood. The bark is removed in most cases, although some mills leave it on, but no attempt is made to take out knots or portions which are stained. The process reduces small fragments of bark and knots to pulp; whole knots are somewhat softened, but are easily removed by the screens. The wood is chipped in the usual way, and conveyed to the digesters, where it is mixed with the liquor. The strength of the liquor varies according to the pressure, time of boiling, and the manner in which heat is applied to the digester, but about 11° Baume is a fair average. (Of course, where live steam is used allowance has to be made for condensed water, and it is necessary to use less liquor, but of higher test.) The liquor contains when properly causticized from 6 to 8 per cent. of Na_2O. The pulp digester in this case held 8½ cubic meters of wood and 6,000 liters of caustic soda liquor, and contained 75 kilos of soda Na_2O per cubic meter of wood. The digesters were heated by direct steam to 110 pounds pressure, and maintained at this pressure for 1½ hours. The yield of each digester was about 1,240 kilos, according to the age of the wood. The pulp obtained at the close of the boil is of a greyish-brown color, while the liquor is a dark, rich brown. It contains very little alkali which is not in combination with the acid products from the wood The contents of the digester are blown into one of a series of iron washing tanks with drainer bottoms, and the pulp is then subjected, after most of the liquor has drained off, to a thorough and systematic washing. Where the pulp is for bleaching purposes, all traces of the liquor should be got rid of, otherwise it will render the bleaching very difficult. It is also important to remove the last traces of the black liquor with as little water as possible, because the cost of concentrating the liquors in the recovery process becomes excessive. For these reasons the pulp in the different tanks is washed with the liquor coming from the tank before it in the series, and the moderate quantity of fresh water which finishes the washing of one lot of pulp passes in succession through four or five tanks, in each succeeding one of which the quantity of black liquor in the pulp is greater, until finally it passes through the pulp which has just come from the digester, and is brought up to nearly one-half the strength of the original liquor. The liquor is then run to the soda recovery department and evaporated to about 6 to 9° Baume. The concentrate is then turned into rotary furnaces, which are in a slanting position, where the lignin and other organic materials are burned off. The residue issuing from the other end of the furnace is composed of carbon and sodium carbonate. This substance is known as black ash, and is passed through a leaching process, and the recovered soda conveyed to the causticizing plant. In this case 82 to 85 per cent. of soda was recovered. The causticizing process consists of converting the soda, which is recovered in the form of a carbonate, to a hydrate or a caustic soda by adding lime and boiling. The result is sodium hydrate in solution with calcium carbonate as a heavy sludge. The lime soon slacks, and is carried into the liquor. The small quantity of lime which at first goes into solution reacts with the carbonate as follows: $\mathrm{Ca\ H_2O_2 + Na_2Co_3 = Ca\ Co_3 + 2Na\ OH}$. The sludge is then thrown away after several washings, the washings being used to boil the soda ash and lime with.

Sulphate Process.—In the sulphate process, which is a modification of the soda process, sulphate of soda is made to replace in a large part the more expensive carbonate. The logs of pine or spruce are cut into lengths of about 130 centimeters, and some of the bark taken off as in the soda process, and taken to the chipper and reduced to about 15 millimeters. The chips are then conveyed to the digesters, which were in this case three stationary, side by side, with a capacity of 26 cubic meters. Into the first of these digesters a little liquor is run in so as to cover the bottom. The chips and liquor are then run in together in the proportion of 13 cubic meters of wood and 5.4 cubic meters of white liquor and 7.6 cubic meters of black liquor. The digesters are connected with each other so that the steam goes from one to the other; when one is blowing off the other is gradually getting up pressure with this steam; live steam is turned on and the pressure allowed gradually to get up to 110 pounds. From four to five hours are taken in getting up this pressure, and it is allowed to stand at this for one hour at a temperature of 165° C., after which it is blown off into a fresh boiler and pressure allowed to drop to 45 pounds, by which pressure it is blown into the wash-pans and washed as mentioned before in the soda process. Sufficient water is allowed to remain so as to reduce the pulp to a fluid state, so that it will flow through pipes or troughs to the sieving department, where it passes through several rotary sieves of various meshes, so as to remove any knots which have not been thoroughly digested. From here the pulp is run into chests, and then on to the paper machine, except in the case of bleaching. The digesting fluid in this process consists of a mixture of caustic soda and sulphide of sodium. The sulphite of sodium is obtained by adding saltcake or sulphate of soda to the ash in the calcining furnace. During the ignition of the mixture the sulphate of soda is reduced to sulphide by the carbonaceous matter derived from the wood by the following reaction: $\mathrm{Na_2\ SO_4 + C_4 = Na_2S + 4Co}$.

This substance forms at a dull red heat a fusible flux, with the sulphate and carbonate of soda present, and is of a reddish-brown color. The loss in recovery was in this case on an average of 14 per cent. New liquor or white liquor is made by mixing in an iron tank of 24 cubic meters capacity 12 cubic meters of strong water at 7° Tw., which is the first filtered water from a previous liquor boiling, called strong water, and 12 cubic meters of the recovered soda solution at 20° Tw. This is agitated, and 1,400 kg. of lime added and allowed to boil for one hour, and allowed to stand until clear, which generally takes about three hours. The liquor is now 20° Tw. The clear liquor is now run off and residue run into the filter-beds, where it is washed with hot water till the water gets down to about 10° Tw., which is collected in a separate tank, and called "strong water." The residue is still allowed to filter till the water registers about 1 to 2° Tw., and is called "weak water." The strong water is used for dissolving the lime, to which has been added the weak water for dissolving the recovered soda ash This is brought up to 20° Tw. The tank when filled ready for preparing the liquor contains 10 cubic meters of strong water at 13° Tw., 10 cubic meters weak water, with soda ash dissolved at 20° Tw., and 1,400 kg. lime.

* * *

—We have received a very pretty and useful souvenir from Harry B. Wood, Limited, Manchester, dealer in wood pulps, chemicals, farina, starches and paper-makers' supplies, in the shape of an ivory paper opener.

PAPER FOR PRINTING

And Some Difficulties in Connection With It.

Mr. R Dennis, in a recent lecture in London, dealt with some difficulties in regard to paper, both from the printer's and the paper-maker's point of view, and suggested some remedies, some of which he had proved by experimenting himself, and some as the result of experiments by paper-making friends of his, while others were derived from printers. The subject of the first difficulty was fluffing.

This was caused by weakness of sizing, and the stuff beaten too fine or short; but in the case of antique woves, it was the desire on the part of publishers to have a very bulky sheet, with the result that the paper-maker dare not press the sheet, and also dare not size fully, because he would not get bulk if he did. Thus, the printer got a practically unmade paper to deal with, and was troubled with fluffing on the page. The remedy he offered for this was that he should retrace his steps and have the sheet properly sized, increase the weight of the reams and let his paper-maker make him an ugly, firm, closely made sheet. He now came to the second difficulty from the printer's point of view, namely, creasing.

The cause of this was immaturity, in the case of litho paper. Cockles would also cause creasing. To remedy it, they must use paper only that has been made and stocked for at least three months. When this cannot be done, for instance, when a customer settles on a paper which must be made and delivered for use in, say, ten days, and which actually arrives at the printer's, say, four days from the time it came off the paper-making machine, it is probably found when stacked with the wrappers off to be wavy, then either spongy or exactly the opposite, tinny, harsh, and inclined to crack, in which case it has probably been dried too fast, or, rather, scorched. If the paper was flabby there would be less trouble to remedy it than if wavy. They would simply hang it overnight in the machine room, or any other room that was warm, and they would find the paper quite workable in the morning, or at latest in twenty-four hours. But, if wavy, as well as being tinny and harsh, they might have to lay it out in a dry room for from at least four to seven days. If they could not afford this time, then they would have to damp and hang it, while if this was impracticable they might put it through on a plain stone. They would, however, probably have trouble with the job right through, and no end of bad or spoiled copies on account of the paper having been rushed through the paper-making machine, and causing immaturity. He now came to this third point—cockles.

This was attributable to paper being dried too quickly, and also to a large extent through the cutting of prices. Makers, in order to keep the cost down to the lowered selling price, used mixed materials of esparto and wood pulp. On account of the different shaped cells in the pulp and their diverse powers of resilience, shrinking and expanding at different rates, together with the high rate at which paper-making machines are now driven, cockles were the inevitable result. These were often caused, too, on account of the drying cylinders of the paper-making machine not being regulated carefully enough. Besides, some mills had not enough of them, with the result that the paper got on to the hot cylinders too soon and contraction set up too quickly. Mr. Dennis next explained why esparto paper was vastly superior, not only for litho but for book work. It was very resilient. If they took an esparto sheet and put it through a glazing machine, subjecting it to considerable pressure, then, after testing it under a micrometer gauge, put it in a drying-room, the next day, on damping it, they would find the expansion that took place was something enormous—about 15 to 20 per cent. There had been no fibre discovered yet which would give them such bulk, such length of fibre, and, consequently, strength, as esparto. In the case of wood pulp, when they subjected it to pressure and crushed the cells of the pulp, they broke down the two side walls, and their bulk at once disappeared. As to the remedies for cockles: He advised them to lay the paper out, without its wrappers on, where possible in the same room in which it was going to be machined, or, if that was not convenient, in some dry room for, say, a week. If they could not give it that time, then they must put up with plenty of spoilt copies, and, if a large sheet, trouble in feeding into the machine. The primary cause of these troubles was cut prices, necessitating undue speed.

Dealing with cheap art papers, the lecturer explained that the surface was more uneven, the strength less, the color lower, etc., and a large percentage of customers, when this was pointed out to them, saw the force of the argument. If they did not at once, they would later, when they found they could get no better result from another printer But his experience of art papers was that most buyers of printed matter spoilt their catalogue, price list or reproduction for want of a ha'porth o' tar. They had good blocks made with a fine screen, went to a lot of expense with their photos, employed good men to write the letterpress, spent in many cases a big price on the cover paper with a fancy name, yet when it came to the paper for the text matter they wanted to cut the price to death. For catalogues, or anything that was going to be kept, a good, brush-coated art paper with a strong esparto body should be made. It would print, fold, look and last better; in fact, in his opinion, an art paper with a cheap, weak body should only be used for a circular or booklet, which was only looked at once and then thrown away.

Printers often grumbled at lapped papers, forgetting that, with the large sheets now made, if they were sent out flat they would most likely get damaged by careless handling. Besides, in the case of cheap papers, a mill could not afford the extra cost and carriage entailed by using boards, which in many cases get "lost"—used doubtless as firewood, to make rabbit hutches, etc. If paper was sent lapped "in and in," but was opened out directly on arrival and stacked for a few days to get the shoulder down, should there be any, then little trouble should result. If it was kept lapped just as it came from the paper-making machine, in many cases he did not believe they would ever get rid of the shoulder, or double shoulders, as the case might be.

On this much disputed question Mr. Dennis said he had seen sparks come out of paper so that it was absolutely impossible to stroke it into the printing machine. One printer had told him that his greatest trouble was with calendered paper, and he attributed the cause of the trouble to the electricity in the paper. It occurred practically only with glazed papers, and nearly always with paper that had been hastily made, reamed up and sent to the printing machine at once. He had never had it occur with paper that had been stored in the mill. If printers did not cut the prices so, they would get a far better paper. The paper would be stocked until it had had time to dry, and then it would keep its sheeny surface better. Where he had been able to give a mill sufficient time to make its paper, whether calendered at the end of the machine or taken away and calendered afterward, and to stand it in a stack at the mill where there was always plenty of ventilation and a warm, dry temperature, then there has been no electricity in the paper.

Coming to the second part of his lecture, dealing with difficulties in connection with modern printing paper from the paper-maker's point of view, Mr. Dennis first referred to odd sizes and odd substances.

Speaking of English conditions, printing machines had so increased in size during recent years, as also had paper-making machines, that it was difficult nowadays to sell demy, the larger quad sizes being now in demand. The bulk of the paper-making machines at the present time had gone up from a 60-inch wire to a 90, 100, 110 and 114-inch, and he believed a wire had been made that was 162 inches wide. The trouble the paper-maker had to contend with was through the machine man not being able to make odd sizes constantly, and he lost in consequence of the stopping and washing up of the paper-making machine. A higher price should be charged to cover risk of paper being rejected, or overmake being thrown on his hands or customer going bankrupt. The same remarks applied practically to odd substances as to odd sizes, for even when it was a regular size there was still the objection that it would not do for ordinary customers, and, therefore, would probably hang in stock a long time.

Small orders of a half, three-quarters or even one ton of a special size, shade or substance were often made at a loss by paper-makers, through the machine having to stop so soon after starting on account of the high speed of the present-day machines, as well as through the time taken to wash up at the finish, which, of course, was as long with small orders as with large. People never expected to pay more for this accommodation.

PAPER-MAKERS' DIRECTORY OF ITALY.

The first edition of this admirable work comes as a surprise. Few people in this country were aware of the large dimensions already attained by the paper industry of Italy. The great quantity of work which has been put into its compilation by the editor, Carlo Minni, and the evident thoroughness with which that work has been done are deserving of gratitude not only from the paper mills of that country, but from all those interested in the industry in other parts of the world. A very useful feature, especially to the latter, is that all the headings are printed in English, French and German, as well as in Italian, and that a small dictionary is included in the book containing the commoner words in those languages. The volume comprises 433 pages, and is divided into the following sections:

Part 1.—Manufacturers of paper, cardboard, cellulose and mechanical pulp in alphabetical order. There are 398 firms named, with particulars showing the importance of each, its productions, chief officers, the railway or lake station by which served, amount of power used in H. P., the number of turbines, wheels or other motors; the machinery employed, the daily output in kilos, the number of workmen, agencies, etc.

Part 2.—Manufacturers of paper, cardboard, cellulose and mechanical pulp, arranged according to location, railway stations, etc. By this arrangement the reader is easily able to form at a glance an idea of the development in any particular spot of the paper-making industry. The list embraces about 100 railways and lake lines, subdivided into 230 stations, and contains over 500 addresses.

Part 3.—Manufacturers of paper goods in alphabetical order. This includes all the firms which work and prepare paper and cardboard, viz.: makers of boxes, pasteboards, labels, envelopes, bags, account books, copy books. school exercise books, albums wall paper, playing cards, sensitized paper, drawing, lace and toilet paper, colored, silvered, gilded, embossed, waxed, oiled, paraffined, corrugated. glassed, and emery paper, paper spools for spinning, cardboards for jacquard looms etc. This part includes 230 firms.

Part 4.—Manufacturers of paper goods arranged according to the regions, provinces, lines and railway stations.

Part 5.—Paper-makers and manufacturers of paper goods arranged according to the class of production.

The volume also includes many other useful features such as a copy of the rules and usages of the paper trade in Italy; officers of various paper associations; table of customs tariffs in Italy with reference to chemical products, resins, colors, varnishes, machinery and other articles employed in the paper industry, as well as on papers and books; a table of transportation rates.

The value of the book is greatly added to by its ample indices, both as to contents and advertisers. We will add that it is bound in cloth boards, and is published by Carlo Minni, Via Aurelio Saffi 9, Milan. Price, Lit 10 at Milan, or L 12 for abroad, postpaid.

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CANADIAN PATENTS

Paper Bag Machine

F. E. Strasburg, Rumford Falls, Me., has patented a paper bag machine (No. 100301) for which the following claims are made:—

Claim.—1. The combination of a rotatable member having a gear fixed thereon, means on the rotatable member for gripping the upper plies of a bag blank, a driving gear, two floating gears connecting the driving gear and the gear of the rotatable member, and means to move the floating gears to vary the speed of the rotatable member relative to the speed of the driving gear.

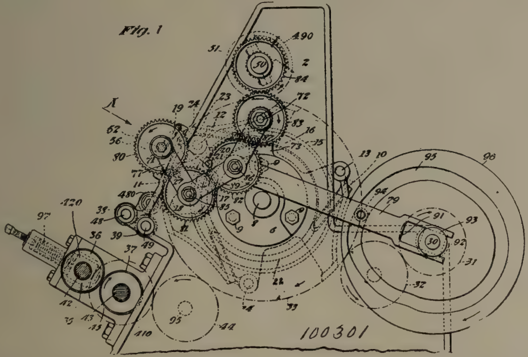


Fig. 1

2. The combination of a shaft rotatable on fixed trunnions, means mounted on the shaft for gripping the upper plies of a bag blank, a gear fixed on the rotatable shaft, a driving gear connected to the rotatable shaft gear through two intermediate floating gears, and a cam-actuated arm for moving the floating gears to vary the speed of the rotatable shaft gear relative to the driving gear.

3. The combination of a revoluble folding bed, means to grip a bag blank thereto, a rotatable shaft above the folding bed, means on the shaft for gripping the upper plies of a bag blank, a gear fixed on the rotatable shaft, a driving gear connected to the rotatable shaft gear through two intermediate floating gears, links to retain the gears respectively in mesh, and means to move the floating gears to vary the speed of the rotatable shaft relative to the driving gear.

4. The combination of a revoluble folding bed, mounted for oscillation toward and away from its axis of revolution, means to grip a bag blank to the folding bed, a member rotatable on fixed trunnions above the folding bed, means mounted on the rotatable member for gripping a bag blank, a gear on the rotatable member, a driving gear connected with the gear of the rotatable member through two intermediate floating gears, links to maintain the gears respectively in mesh, and a cam-actuated arm connected to one of the floating gears to move the floating gears to vary the speed of the rotatable member relative to the driving gear.

BRITISH PULP & PAPER ASSOCIATIONS

The tenth annual meeting of the British Wood Pulp Association took place on December 6th, Mr. J. Y. Henderson in the chair, owing to the indisposition of Capt. Partington. To an enquiry by F. E. R. Becker as to why certain statistics had been omitted, the honorary secretary, W. J. Mather, stated that it was not thought necessary to publish them every year, and that consuls in different countries would not take the trouble to give the figures to the Association every year.

L. P. Andrews pointed out that the new contract note was not put forward as a complete one by any means. He considered these contract notes ought to be dated, so that in making contracts they would know what set of rules they were under. No new contract note would be complete without a rule as to the amount of pulp to be left unused at the mill if a claim is made in respect to the bulk.

L. Clegg said it had been pointed out to the Paper Makers' Association that it would be advisable to postpone any discussion on the contract note until both Associations had consulted together.

It was decided to appoint a subcommittee to meet the Paper-Makers' Association and to go into the matter.

Captain Partington was unanimously re-elected president. F. Lloyd, T. E. Reed, C. T. Owen, W. G. Taylor, C. T. Craig, L. P. Andrews, H. B. Wood, J. Y. Henderson and J. A. Nordberg were re-elected vice-presidents.

D'Oyley-Mears was elected honorary secretary, and Edwin Klinton honorary treasurer.

At the dinner L. P. Andrews spoke of the constant and rapid increase in the use of paper, and of the erection of a new mill at Grimsby, the first built in England for twenty years.

S. Chadwick said he had been called the greatest pessimist in the paper trade, but considered he had some reason for it when he thought of the development in other countries and compared that with what was going on in England. He complained greatly of English newspapers using foreign-made paper.

T. Y. Nuttall gave the toast of the evening, "The Wood Pulp Trade." Good-will between manufacturer and customer was a very real asset in business, one that was worth a good deal of money, not only in making business go smoother, but leading to its extension. He did not want it to be heralded in Scandinavia and Canada that they were down-hearted. They wanted it to be felt that they recognized the competition, and were willing to meet it on fair and equal terms. He believed in England's prosperiy, and that the prosperity of all was the prosperity of each individual. They ought to be broad-minded enough to recognize that there was room in the enormous consumption in England for all of them to be producing successfully. He challenged denial on that point, and wished long life to the British Wood Pulp Association.

J. Y. Henderson, in responding to the toast, reminded his hearers that the wood pulp trade about twenty-eight years ago amounted to a few thousand tons, and he saw from the latest report that next year 57,000 tons of sulphite pulp and 100,000 tons of sulphate pulp would be made in Scandinavia alone. But, although the production was so much larger, the consumption had increased enormously also, and it was undoubtedly a fact that the cost of raw materials in the manufacture of wood pulp had also gone up. He did not anticipate—and he said this as a word of warning to paper-makers—that the low prices which prevailed two or three years ago were likely to be repeated.

On the same day the Paper-Makers' Association held their general meeting under the chairmanship of Lewis Evans, J.P.

An important discussion took place on proposed amendments to the wood pulp contract note in regard to suspension of deliveries, owing to force majeure. H. W. T. Garnett proposed the addition of the words, "for a period not exceeding six months," so as to prevent any abuse of the clause. The amendment finally carried as follows: "Any deliveries so suspended by the seller (or the buyer) more than six months after the period assigned to this contract may be claimed by the buyer (or made by the seller) at the same rate of delivery if such claim be made (or notice be given) within a month after such six months' suspension." Any deliveries not so claimed (or notified) are cancelled. This clause, it may be stated, is being reconsidered by the Wood Pulp Association.

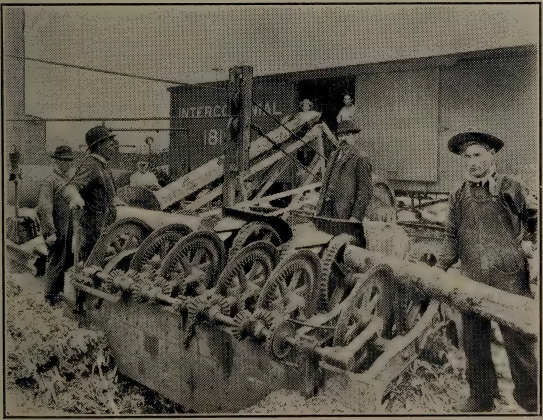
A resolution in favor of a bill to prevent railway companies declining responsibility for damage in transit was carried unanimously. At present a complainant has to prove not only gross carelessness, but wilful damage, which is impossible.

Several references were made to the increasing importation of foreign papers and its bad effect on English mills.

* * *

THE MOREAU PULP-WOOD AND LOG BARKER.

The Moreau Barking Machine Co., Limited, of Mitchell, P.Q., are having great success with their well-known pulp-wood and log barker, which is interesting not only the Canadian pulp mills, but those of the United States.



The machine was expressly built to peel pulp-wood, and will peel wood of any dimensions from three inches up, and of all lengths from 36 inches up. In addition to the success of the machine for pulp-wood purposes, it is extensively used by veneer mills to bark logs, and for the preparation of wood for excelsior work, and for peeling telephone, telegraph and fence posts. The company, of which C. Manseau is the sales manager, can furnish excellent certificates from present users of the machine.

PAPER AS INSULATING MATERIAL.

Comparisons have recently been made as regards the relative merits of india-rubber and paper as insulators for electric wires. The experiments were carried out with an alternating current of 25 periods, and varying from 6,000 to 12,000 volts. Paper is cheaper than rubber, but requires an outer casing. While, on the other hand, paper stands temperatures not exceeding 194° F., rubber is rapidly perished by exposure to a heat of 150°. The following figures show a marked superiority of paper over rubber for this particular purpose:—

	Cable coated with	
	Paper.	Indiarubber.
Length	11,000 ft.	25,000 ft.
Cross-section of the copper......	¼ sq. in.	¼ sq. in.
Thickness of the insulating layer	⅓ in.	⅓ in.
Temperature	80° F.	80° F.
Average current..	0.47 amp.	2.16 amp.
Total loss of energy	312 watts	4,260 watts

PAPER-MAKING IN NORWAY.

Paper-making in Norway dates from 1880. The mills make printings, news and wrappings chiefly. The wood employed is mostly spruce. Connected with the paper mills is generally a saw-mill, where the butts of the large trees are sawed, while the tops, branches and small trees which have been cut to thin out the forests go to the pulp and paper mills.

Both mechanical and chemical pulp are used by the Norwegian paper mills. The pulp is reduced to an even, consistent mass, containing about 60 per cent. of water, and conducted into a receptacle where sizing is added; thence through the paper machine, where it is evenly distributed in a thin layer on a wide, endless belt, which passes through a system of hollow horizontal rollers. These rollers are heated by steam; they are placed side by side, with very little space between, and turn on their own axis on a vibrating metal frame. The belt holding the layer of pulp is carried along by the rollers, and the thin mass dries quite rapidly.

The width of the paper is determined by dividing belts placed on each side of the main belt or bed holding the unfinished paper. The dividing belts may be set apart for any desired width of paper. When the paper is dry it is finally passed between two cloth-covered rollers, where it is given finish and lustre; thence between another set of warmed rollers, which completes the operation. As the paper escapes, it is received on a revolving reel and cut in the desired lengths.

TRADE ENQUIRIES.

The following enquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these enquiries, with their addresses, can be obtained upon application to Superintendent of Commercial Agencies, the Department of Trade and Commerce, Ottawa, or to the "Pulp and Paper Magazine," Toronto.:

1. **Paper and boards.**—A London paper agent and merchant dealing in paper and boards is desirous of corresponding with Canadian manufacturers who are seeking English trade.

26. **Envelope and card box boards.**—A Manchester firm asks for prices and catalogues of envelopes and of card box boards from Canadian exporters.

86. **Envelopes, &c.**—Yorkshire printing house makes inquiry for Canadian buyers of general commercial printing work, and every description of envelopes and general stationery.

100. **Agent.**—A Scotch firm manufacturing woodworking machinery of all kinds, and also small engines and air compressors, seeks the services of competent Canadian resident agents.

104. **Paperhangings.**—A firm in Antwerp would quote lowest prices for paperhangings to Canadians interested in this merchandise.

THE REVISED TARIFF

The new tariff has been under the fire of discussion in committee for some time past. A few changes have been made in items affecting the paper trade, but none of any very great importance.

On the question of the duty on news printing paper, now 15 per cent., there was considerable debate.

Mr. Perley urged that Canada being a country where the manufacture of paper was a natural industry, therefore the duty should be higher.

Mr. Fielding, in reply, agreed that Canada should be able to make paper cheaply owing to the great wood supply. Therefore paper could be manufactured cheaply. But the fact of the matter was the Government had reduced the duty to 15 per cent. because a commission had reported that a combine existed.

Dr. Sproule criticized the Government for having reduced the duty instead of having put the criminal code into force.

Mr. Fielding pointed out that the enforcement of the criminal law rested with the Provincial authorities. Newspaper men complained of the combine, and asked that the duty be reduced. The Government replied, "Prove the existence of the combine and we will reduce the duty." This they did, and the Government reduced the duty accordingly, and received the thanks of the newspaper men.

Mr. Perley, Geo. H. Fowler, and Hon. Geo. E. Foster contended that the Government had by admitting outside paper punished the workingmen of the country in order to get at half a dozen combinesters. The penalty of admitting foreign goods at a lower rate was, in their opinion, an unscientific one and penalized the wrong parties.

Mr. Alex. Johnston, as a practical newspaper man, contended that the Government had taken the only effective remedy against the paper combine. So long as the duty remained at the old rate, even the punishment of those in the combine under the criminal code would not have reduced the price of paper below the unfair figure which the combine charged.

Mr. Paterson pointed out that the commission found the combination were enabled to unduly raise the prices by reason of the existence of the duty as it there stood. The Government then reduced the duty to a figure which would give reasonable competition.

Mr. Fielding quoted from the act to show that the Government in reducing the duty had merely carried out the directions of the statute. Moreover, he reminded the Opposition that after all only $5,000 of news print had been imported last year.

After a lengthy debate the item was passed.

On the item pulp of wood or of straw, 25 per cent. general tariff, Mr. Bergeron asked that an export duty be placed on pulpwood.

The Minister of Finance said the question was a big one, which he was not prepared to argue at such a late hour. The smaller operator near the boundary might be seriously affected by the imposition of a duty. Again, with regard to the Government lands, a restriction might be placed on cutting, which practically amounted to an export duty.

Mr. Bergeron said that the United States were drawing on one of Canada's natural assets under present conditions to preserve their own wood. A temporary reduction in the price of wood might follow the imposition of the duty, but in the long run Canada would benefit.

Mr. Fowler supported Mr. Bergeron. The result of the duty would compel manufacturers of paper to remove their mills from the United States to Canada.

Mr. Logie pointed out that Americans would retaliate by placing a higher duty on manufactured pulp.

Other points at which the proposed tariff has been revised are as follows:

Item 192—Giving the duties on straw board millboard and cardboard, insert after latter word, "not pasted or coated."

Item 201—Providing for the free importation of matrix paper, adapted for use in printing, insert after the word paper the words, "not being tissue papers."

Item 237, which gives the duties on celluloid made in different shapes as well as celluloid blanks, has added to it the words "and comb blanks." All are dutiable at 5, 7½ and 10 per cent.

Item 442 has been made to read: "Printing presses, lithographic presses and type-making accessories therefor, also machines especially designed for ruling, folding, binding, embossing, creasing, or cutting paper or cardboard, when for use exclusively by printers, bookbinders, and by manufacturers of articles made from paper or cardboard, including parts thereof, composed wholly or in part, of iron, steel, brass or wood, preferential 5 per cent., intermediate and general 10 per cent. each.

Item 531 is struck out and the following substituted: Cloth, such as used in covering the outside of books, when imported for use exclusively in the use of binding books, under regulations made by the Ministers, made free in all tariffs.

❧

VULCANISED BOARD.

"Papier-Fabrikant" says that by parchmentising rag papers, combining them under pressure in a bath of sulphuric acid, the result is a thick board, horn-like in substance. This product, resembling vulcanised caoutchouc, represents an original horn-like substance.

The contributor says: For transforming the cellulose we use various chemicals, such as chloride of lime, chloride of calcium, chloride of aluminium, nitric acid, and sulphuric acid. These are either applied in mixtures or in addition of the chemicals to foregoing mixtures, according to the nature of the raw material or to the purpose in view.

I found boards of a similar nature of four-fifths of an inch in thickness of a yellowish, brownish shade produced by the parchmentising of rag paper, and these boards were workable like horn.

Several single, thick, unsized sheets of paper were parchmentised and combined under pressure. The process had been performed by using sulphuric acid of 65° Bé., reduced with water to 6° Bé. and cooled to a temperature of 10°, C.

The time required for preparing any class of paper has to be found by trials. The influence of the acid should not last longer than required; in most cases one minute's time is sufficient for the soaking even of thick paper and the production of a slimy, pasty substance on the fibre surface, while the fibre in the middle of the sheet remains practically preserved. This condition represents the best product, because whenever the acid acts too severely the result is found to manifest itself in a crisp, hard and easily destructible matter.

After sufficient action of the acid the sheet is pressed between glass rollers, and passes through a water bath, containing admixtures of soda and ammonia, sufficient for neutralising the acid entirely, because the quality of the sheet would soon be destroyed by very small traces of the acid. After washing the sheets retain a sticky surface, and a certain number of the same, answering for producing the desirable thickness of the board, are arranged together into sets, each to form one sheet of board; these are intersected with planks or with metallic sheets, and then subjected to heavy pressure. Thereafter the boards are dried in the air, but only until they attain about 85 per cent. of dryness. Then they are smoothed in calenders between heated rollers until they are perfectly dry.

In a similar manner we may treat thick sheets of board that would be transformed only on their surface into a horn-like substance. These represent the outside appearance of a sheet that has been formed from several sheets of the entirely saturated material—they are perfectly waterproof, extremely hard and very firm, consequently they are adaptable to many useful purposes.

AMERICAN PAPER AND PULP ASSOCIATION

The thirtieth annual meeting of the American Paper and Pulp Association took place on the 7th inst. Vice-President A. B. Daniels referred to the recent universal advance in certain grades of writing paper which had not been made until long after it was needed. He gave a word of credit to the dealers for the way in which they had assisted manufacturers in carrying through their plans.

J. N. Mohr in presenting his report on the book division, remarked that though there never was a time in the history of the country when money was so quickly made, yet publishers declare it is not put into standard books.

A. D. Little, the official chemist, remarked that in the sulphite process manufacturers had shown an increasing tendency towards the use of stronger liquors, particularly in Sweden. There has also developed a tendency towards shorter cooks, meaning a considerably increased output from the same plant. Last year witnessed the introduction of several new types of sulphur burners of large capacity and of the rotary or agitating types, permitting workmen to maintain a much higher content of sulphurous acid in the burner gas, owing to their better control of the air supply.

Eulogistic reference was made to the growing importance of Kraft brown, one result of which was to furnish evidence that the possibilities of wood papers have not yet begun to be appreciated

Among the resolutions passed by the Association was one to the effect that it "looks upon water storage as a most important means for the development of the water resources of the United States." Another called on all pulp manufacturers of the United States to adopt conservative methods in lumbering.

David S. Cowles was elected president,, and L. Chable, secretary of the Association.

The third annual convention of the National Paper Trade Association was held on the same occasion, President J. E. Linde in the chair.

Charles L. Huff, in an able paper on the advantages of co-operation, particularly in the paper trade, remarked: "There is no natural feud between the jobbers and the mill men; they are not antagonists, enemies to be exterminated or circumvented. The mill men must have an outlet for their products, or the mills must close; the jobbers must have a constant source of supply, or they must put up their shutters and go out of business. Each is necessary to the other. A pair of scissors consists of two blades united; they move in opposite directions, but both are necessary. Sensible men nearly always can, in conference, agree on the justice of any claim or the correction of any evil."

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Georg Busch, of Becker & Co., London, writes thus of his recent trip to this country: In Canada I found a tremendous demand for mechanical and sulphite from the States—the former occasioned through a rather serious scarcity of water, the latter through the closing down for weeks of the Burgess sulphite mill on account of strike. Just before I sailed home, however, I saw several paper-making friends in New York, and understood from them that Burgess was working again, and that copious rains had relieved somewhat the situation as far as mechanical was concerned. Nevertheless, the Western States appear still to be more or less dependent upon Canada for their supplies, and if hard frost sets in any stocks will find ready buyers.

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Snow in Lake St. John region has greatly retarded pulpwood operations. Pulp is advancing.

The British market for chemicals is firm with a good demand.

The Difference Between Sulphite and Soda Pulps.

Dr. Schwalbe has worked out a method of distinguishing sulphite from soda pulp. Professor Herzberg has shown that the rosin content of bleached or unbleached soda pulps does not exceed .06 or .07 per cent., while the bleached and unbleached sulphite pulps contain .39 and .65 per cent. rosin.

There is a well-known and very delicate test for rosin, the so-called cholesterine reaction, which depends upon the fact that rosin dissolved in chloroform, to which is afterwards added acetic anhydride, gives with concentrated sulphuric acid at first an intense reddish-purple color, which gradually changes to blue or green. In consequence of the larger percentage of rosin in sulphite pulps these should show the cholesterine reaction much more strongly than soda pulps. It was not found possible to apply the tests directly to the pulps, but it was found necessary to extract the rosin in the first place with ether or chloroform, and then apply the test to the extract. About half a gram of the pulp is treated with 1 to 2 c.c. of chloroform, or, still better, carbon tetrachloride, and heated to boiling. The liquid is poured off into a test-tube, and half c.c. of acetic anhydride added, and finally pure concentrated sulphuric acid drop by drop.

In the case of a sulphite pulp a beautiful pink color first appears, which may be seen very distinctly if the tube be held against a piece of white paper; this color quickly disappears, and a further addition of acid produces a green color. The addition of sulphuric acid should be so made that the liquid separates into two layers, the upper of which is distinctly green, while the under remains colorless. Altogether, some six or ten drops of acid are necessary.

In the case of a soda pulp no color reaction can be detected—at the most, a dirty yellow color makes its appearance. Dr. Schwalbe has tested various sulphite pulps in this way, and, with the exception of two, obtained the reaction immediately without any trouble. The two exceptions were samples of bleached sulphite pulps, and it appears necessary, in cases where the pulp is strongly compressed, to allow the carbon tetrachloride to stand in contact with the pulp for a quarter to half an hour, occasionally warming the liquid. These two samples, which did not give a reaction at first, had to be extracted in this manner. A good way is to leave the pulp standing over night in contact with the carbon tetrachloride, when it will be unnecessary to heat the liquid.

The reaction takes place both with bleached and unbleached pulps; the presence of rosin may be detected in many cases by merely pouring the carbon tetrachloride on to a clock-glass, and allowing it to evaporate. In consequence of the presence of rosin, the liquid soon begins to get milky, and when wholly driven off distinct traces of rosin remain.

In the case of soda pulp the milkiness does not make its appearance until a much later stage, or not at all.

Dr. Schwalbe also draws attention to the fact that the well-known zinc chloride iodine solution may also be used for differentiating between soda and sulphite pulps, whether bleached or unbleached. The same number of drops of reagent are allowed to fall upon the pulps under examination. After standing three or four minutes the excess of zinc chloride iodine solution is mopped up, and the spot washed by wetting a few times and mopping up the water.

In the case of soda pulp the blue-black spot is completely removed, while with sulphite pulps a pale blue color remains, even after repeated treatment with water. The time taken to remove the color will, of course, depend upon the intensity of the original coloring Where much reagent was originally used it may take hours to wash out the color.

One caution is necessary: a compact sheet of sulphite pulp must not be compared with a loose sheet of soda pulp, as the latter, in consequence of its looser texture, absorbs more of the reagent; which, in consequence, takes longer to wash out. In such cases it is as well to reduce the sheets to pulp before making the test.

THE CRUISE OF THE NEPTUNE.

Those who have heard Commander Low speaks on the subject of his explorations in the Far North will readily believe that the official report on the Dominion Government expedition to Hudson Bay and the Arctic Islands on board the D. G. S. "Neptune," in 1903-1904, would be not only full of information but of absorbing interest.

The Dominion Government in the Spring of 1903, decided to send a cruiser to patrol the waters of Hudson Bay and those adjacent to the eastern Arctic islands, also to aid in the establishment, on the adjoining shores, of permanent stations for the collection of customs, the administration of justice, and the enforcement of the law. For this purpose it appointed Major J. D. Moodie, of the North-West Mounted Police, as acting Commissioner of the unorganized Northeastern Territoies. The "Neptune," a stout wooden ship, built entirely of British oak, and the largest and most powerful ship of the Newfoundland sealing fleet, was chartered to convey the exploration party, and in June, 1903, A. P. Low was instructed to proceed at once to Halifax, make any necessary alterations to the vessel and prepare for a two years voyage in the Arctic regions.

The present volume is a narrative of the voyage from first to last. It also contains under appropriate headings, a short historical account of earlier explorations and discoveries in that region; a geographical sketch together with summaries of what is at present known regarding its inhabitants and geology; short descriptions of the important whaling and sealing industries, and some valuable opinions as to the possible navigation of Hudson Bay and Strait. In appendices there is stated the result of meteorological observations taken on the voyage; interesting notes on the thickness and growth of ice; lists of the birds, plants and fossils collected during the voyage.

The book, which is printed at the Government Printing Bureau, Ottawa, is embellished with a map and with some fine illustrations, showing the scenery and some types of the inhabitants of this wild Northeast country.

CANADIAN FORESTRY CONVENTION.

The annual meeting of the Canadian Forestry Association will take place in Ottawa on the 14th and 15th prox. In order to make the discussion on forestry subjects as general as possible it has been arranged to have the program so as to have one person give a short paper or address to lead the discussion at each session, to be followed by speeches. A specially illustrated lecture will be delivered on the evening of the 14th.

DANISH PAPER MILL DIRECTORY.

The Dansk Papir Adressebog for 1907 comes to hand in a pleasing red cover. As to its interior, it is equally pleasing in appearance, the arrangement being strictly alphabetical under each class, and the headlines in large easily read type. There are about 120 pages of matter, besides the useful feature of several pages of ruled paper for the purpose of making memoranda. It is published by Dansk Papir Tidende, Astergade 9, Copenhagen. Price Kr. 2.50. Post free.

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The E. B. Eddy Co., Hull, Que., report a heavy demand for all their lines of paper and fibre wares. News, wrapping, tissue and toilet papers, are active sellers.

Literary News

The convention number of the "Paper Trades Journal," New York and Chicago, is a fine specimen of the publishers' art, in respect to paper, printing and to contents. The proceedings at the recently-held thirtieth annual meeting of the American Paper and Pulp Association are given at great length, with portraits of the prominent speakers and officers. The number contains no less than 314 pages.

The "Canadian Forestry Journal" for December contains a full report of the Forestry Convention held in Vancouver on the 26th and 27th September. Interesting articles are "Timber Conditions in British Columbia," by Hon. R. F. Green, Chief Commissioner of Land and Works; "Lumbering Conditions on the Coast of British Columbia" by R. H. Alexander; "Dominion Forest Reserves in the Dry Belt of British Columbia," by Roland D. Craig. There are the usual number of fine cuts.

The annual Trade Review number of the "Canada Lumberman and Wood-Worker," just issued, consists of 100 pages, enclosed in a specially designed cover of very attractive appearance. The contents include a comprehensive review of the production and export of lumber, with comparative statistics, portraits of the lumber trade representatives in the present Dominion Parliament, thirteen interesting articles by recognized authorities in the lumber trade, illustrated descriptions of modern saw mills and woodworking factories, and many other interesting features. Every branch of the lumbering industry is covered. The publishers are the C. H. Mortimer Publishing Company, Toronto, with branch offices at Montreal, Winnipeg and Vancouver.

* * *

E. and J. E. Mercier and S. C Fortier, of Levis, Que., have been incorporated for the purpose of printing and binding books and printing and publishing newspapers. The capital stock is $20,000.

The newspapers of Sault Ste. Marie, Mich., are strongly urging the Lake Superior Corporation to remove all obstacles to proposed improvements in the pulp waterway. Unless the corporation consents, the Michigan Legislature will be asked to repeal the specific tax law under which the Michigan-Lake Superior Power Co., a subsidiary corporation, pays only $5,000 annual tax on property which cost over $6,000,000, and of which the city receives nothing. With this club over the head of the corporation it is hoped to help the Government in its fight for improvements.

Tenders for Pulpwood Concession.

Tenders will be received by the undersigned, up to and including the eighth day of March next, for the right to cut the Pulpwood on a certain area, in the District of Nipissing, north of the Townships of Holmes, Burt, Eby, Otto, Boston, etc., and immediately west of the interprovincial boundary line.

Tenderers should state the amount they are prepared to pay as Bonus, in addition to such dues as may be fixed, from time to time, for the right to operate a pulp, or pulp and paper industry on the area referred to. Successful Tenderers will be required to erect mills on the territory, or at some other place approved by the Lieutenant-Governor in Council, and to manufacture the wood into pulp in the Province of Ontario.

Parties making tenders will be required to deposit with their tender a marked cheque, payable to the Treasurer of Ontario, for ten per cent. of the amount of their tender, to be forfeited in the event of their not entering into agreement to carry out the conditions, etc. The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital required to be invested, etc., apply to the undersigned.

F. COCHRANE,
Minister of Lands, Forests and Mines.

Toronto, December 29th, 1906.

No unauthorized publication of this notice will be paid for.

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Filling for all styles of Jordans
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The John McDougall Caledonian Iron Works Co.
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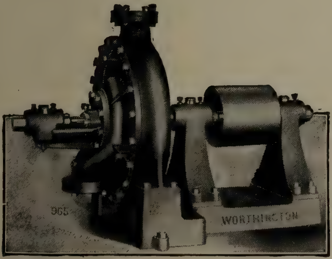
MONTREAL, P.Q.



Worthington Turbine Fire Pump, working pressure 160 lbs.

BOILERS:

Return Tubular " McDougall "
Water Tube, etc.

TANKS:

Water Tanks, Penstocks, Steel Riveted Pipe.

Hydraulic Presses:

For Pulp and Paper Mills.

Builders in Canada for " WORTHINGTON " TURBINE PUMPS, CONDENSERS, Etc. and New York Filter Co's. Pressure Filters.

HOLYOKE MACHINE COMPANY

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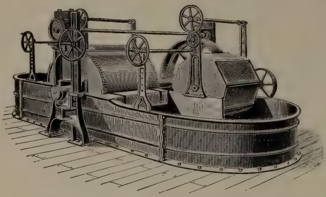
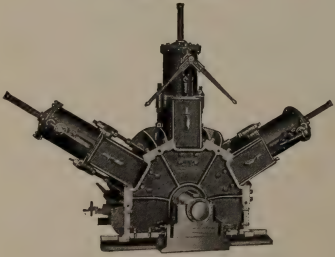


Washing and Beating Engines with Patent Double Hoist and Tubs of either wood or iron.

Hydraulic Pumps and Presses.

Rag Cutters and Rag Dusters.

Chilled Iron Rolls.



Patent Improved Wood Pulp Grinder.

Elevators, Rotary Fire Pumps and Friction Gearing.

Gears Accurately Spaced and Planed.

Shafting, Pulleys and Mill Work.

Machinery for Wood Pulp and Paper Mills.

Vertical and Horizontal Water Wheels with Flumes and all connections.

Wood Barkers, Wood Chippers and Wet Machines.

Newest Designs

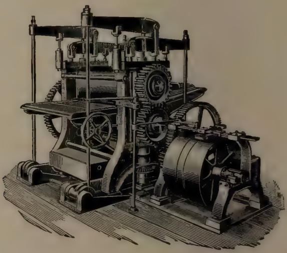
AND

Highest Efficiency

Cotton and Paper Rolls with Patent Fastenings.

Calenders. All kinds of Super Calenders, Friction Calenders and Platers.

Special Machinery.



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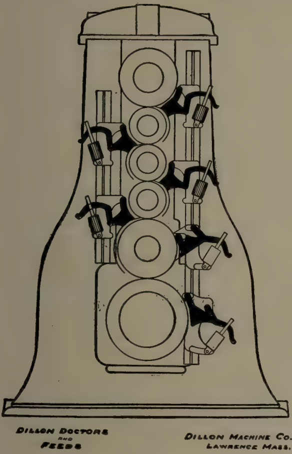
PAPER MILL MACHINERY



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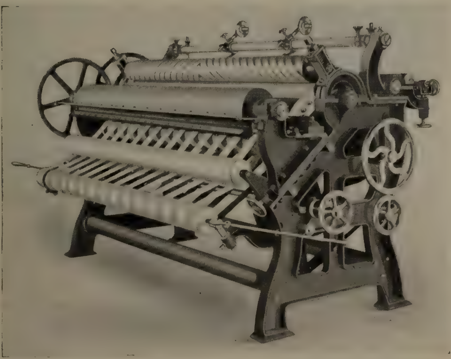

LAWRENCE, MASS., U.S.A

ROSIN IN PAPER-PULPS.

The Prussian Government has carried out an exhaustive series of researches into the question of the amount of rosin in paper-pulp, says "Papier Zeitung," as such pulps often throw out rosin, with disastrous results to the paper-maker. What detracts from the value of these investigations, however, is the fact that this throwing out depends principally on the way in which the pug-mill is worked. Every sulphite pulp contains rosin, and no matter how small the amount may be it acts prejudicially in the pug-mill, in the devil, and in the kneading machine, unless special precautions are taken. The particles of rosin cling together into lumps under the influence of the heat and friction, and these lumps are scraped off by the mill-scraper. This is the cause of the injurious effect, which would be inappreciable if the rosin remained in its originally finely divided state. No method is known of separating out the rosin during the preparation of the sulphite-stuff, so it is necessary to seek for means of making its presence harmless. All kinds of sulphite-stuff, bleached or unbleached, contain quite considerable quantities of rosin, and it rapidly gathers into lumps.

The exact extent of the harm done naturally varies, it being less the coarser the paper. It must not be forgotten, too, that this lumping of the rosin entails frequent and troublesome cleaning of the machinery.

As regards the remedy, the first point to be considered is that last alluded to. The rosin lumps cling first to the machinery, then pass therefrom into the paper-mass. The remedy is then to prevent this accumulation of rosin on the moving parts. To do this sawdust, waste paper, straw-cellulose, soda-cellulose, or dried rags should be put in at intervals during the devilling, or mixed with the sulphite stuff to begin with. In the latter case the additions which are free from rosin take it up from the sulphite mass, and prevent it from collecting on the machinery.

If the pug-mill was not to be used, as is the case for certain kinds of paper, the cellulose should be dissolved in the bleaching out, where there is little chance of a separation of the rosin.

The amount of rosin in a pulp varies, as any large consignment is made from a number of trees, probably of different sorts. Even if it results from trees all of the same species, no two individuals contain the same amount of rosin. Practically all trees contain more or less; but, as is well known, the coniferæ bear the palm in this respect. As long as the amount of rosin is not excessive, it will not hinder the sale of a pulp; but, unfortunately, no exact determination of the maximum percentages of rosin which are allowable for various papers has as yet been made.

THE MARKETS.

Toronto, Feb. 16, 1907.

Conditions for getting out pulpwood have not been good on the whole, owing to the state of the weather. There was some snow in Northern parts of Ontario toward the end of January which improved things a little, but before that all the indications pointed to a scarcity, and probably higher prices. Groundwood continues at about $24 to $26 delivered, and sulphite at $42 to $46. Prices in Quebec for pulpwood have advanced. The paper situation has not made much actual change, though book paper is quoted usually at a fraction higher. Writing papers are quite stiff in price in accordance with the recent upward movement. Wrappings are a little firmer in tendency, while news print also is strong

Position Wanted

Superintendent open for Engagement.

1st of March. A1 on Book, Bond, Blottings and Coating Stock. 17 year's experience in different parts of the Globe. Used to the working of daily cost sheets. Would not object to handling a mill making a lower grade with a view to working it up to Book and Blottings. Highest reference as to ability, character, etc.

Address M. R. J.,
care Pulp and Paper Magazine, Toronto.

THE **Swenson** EVAPORATOR

Boils off Water, not Spent Caustic.
Is easily kept clean.
Seldom repaired, and then with ease.
Works most Rapidly and Efficiently.

American Foundry & Machinery Co.
(Formerly WALBURN-SWENSON CO.)
Works: CHICAGO HEIGHTS. 944 Monadnock, CHICAGO

Port of Manchester

The Central Port of Great Britain. Manchester is the nearest port to the enormous paper industry of the North and Midlands of England. Direct connection with the sea by the Ship Canal. Unexcelled facilities for the handling of cargo. Importers of machinery and paper-making material and exporters of pulp and paper should obtain freight rates via Manchester, thereby effecting a saving in cost of transit and also in handling. Regular direct sailings between Canada and Manchester.

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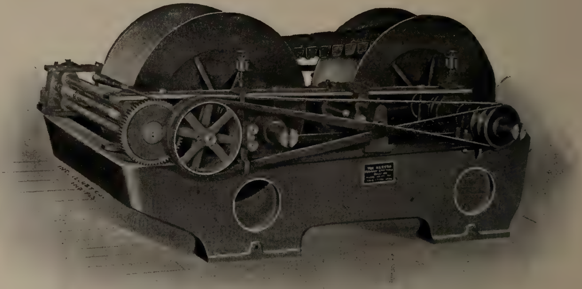

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Variable Speed Transmission

The one practical device for regulating the speed of the paper machine.

It everlastingly gets away from the nerve racking old true cone, in whatever form it seeks to disguise itself.

There is absolutely no shifting of belt.

It is made in sizes to drive anything from a winder to a 140" Fourdrinier.

Any speed within its extreme range of variation may be instantly secured and the changes effected without breaking or stopping the paper sheet.

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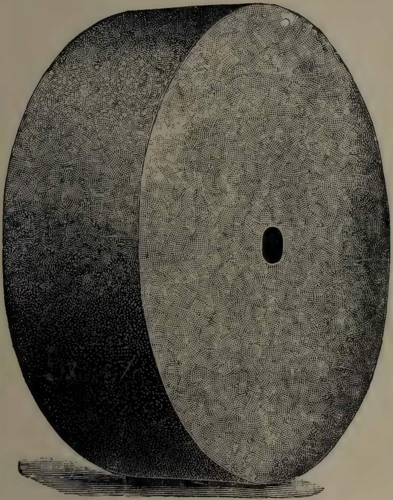

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Artificial Emery and Quarzstones

Stones of all kinds used in Wood Pulp and Paper Manufactories.

Six Own Quarries at
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PIRNA-ON-THE-ELBE (SAXONY)

Oldest Factory for Wood Grindstones in Germany. Established 1866.

THE MOREAU PULPWOOD and LOG BARKER

Built expressly to peel pulpwood.

Capacity, 3 Cords per hour with 2 men and 6 horse power.

It will save the bark which can be used for other purposes.

Peels wood of all dimensions, 3 inches up and of all lengths from 36 inches up.

The most desirable certificates and full particulars on application to

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C. MANSEAU, Selling Agent for U.S. and Canada, Mitchell, Quebec.

RELIABLE AGENTS WANTED.

PULP STONES

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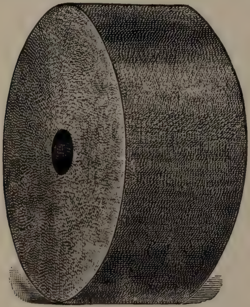
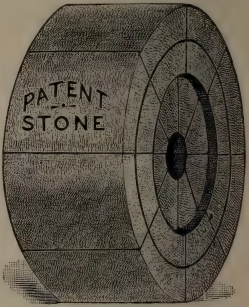




the construction of which gives to it advantages not found in the one piece stone.

Let us tell you about them

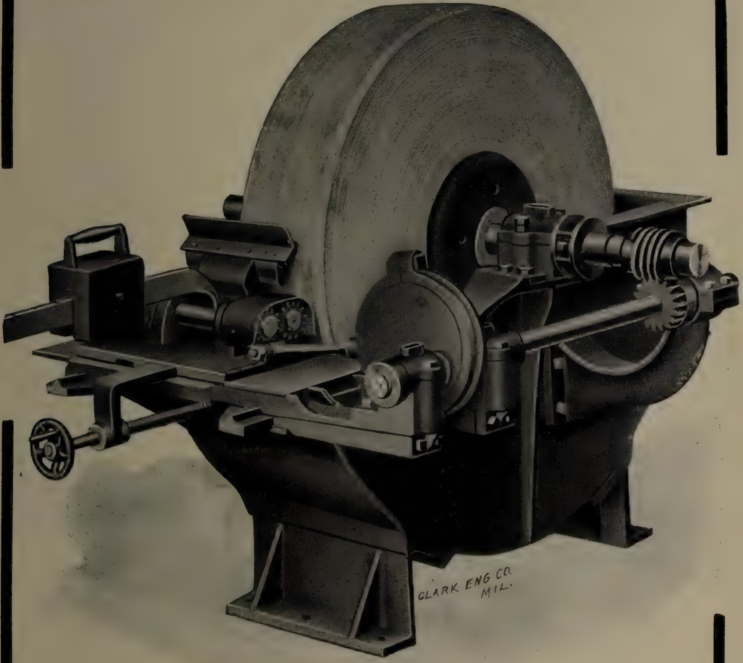
JEAN FREESE

132 NASSAU ST., NEW YORK, U.S.A

—**Erratum.**—In the article in last issue, entitled "Western Canada as a Paper Market," the figures of the annual consumption of paper by the Winnipeg "Free Press" should have been stated as in pounds, not tons.

Valley Iron Works Co.,

Paper & Pulp Mill Machinery Specialists



AUTOMATIC BARKER KNIFE GRINDER.

This machine has a capacity of 150 perfectly ground knives per day, and does not draw the temper of the knife—therefore effects a saving in your knife account. It is the only machine of its kind on the market.

WRITE US FOR PRICES.

Valley Iron Works Co., Appleton, Wis.,

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EXTENSION FURNACES, HIGH PRESSURE HORIZONTAL TUBULAR BOILERS, IMPROVED DIGESTER, IMPROVED VERTICAL BOILERS.

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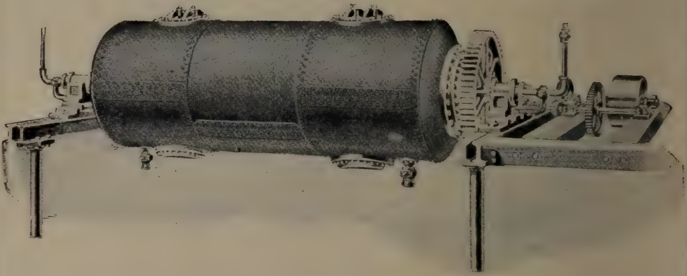

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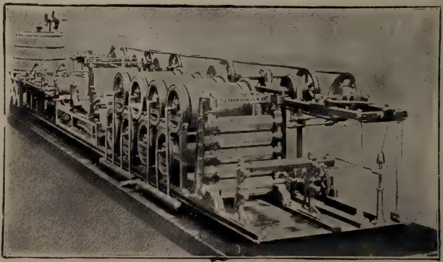

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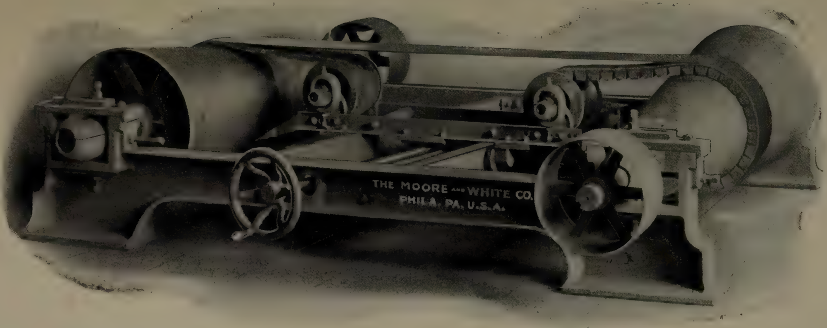

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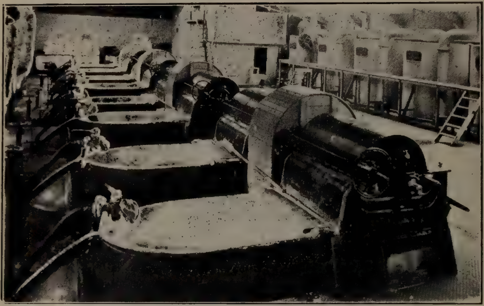

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500 Twelve-Foot Logs per Hour

Cut into two-foot lengths ready for the barker. That is the ordinary capacity of

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On account of its many advantages, and the fact that it requires only one man to operate, our machine has replaced expensive systems requiring the services of 18 to 20 men.

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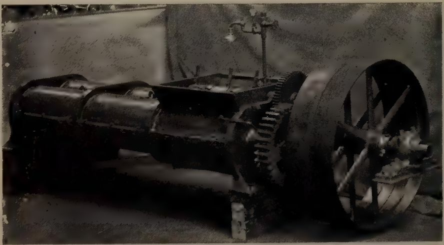
For PULPING UP MACHINE "BROKE," OLD PAPER STOCK, WASTE PAPERS, DRY WOOD PULP, &c.



Three Segment Pulping Engine—Trough 800 and 2,000 lbs.

OVER 300 SOLD 3

These Machines, with the same power, do from TWO to FOUR TIMES the WORK of STONES, without Shortening, Affecting, Creasing, or Wetting the Fibre in any way, or Changing the Colour or the Sizing.

Beaters not required in making Boards from Old Paper Stock.

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Cylinder Paper Machine, 72 inches wide, complete from screen to winder, including steam engine, all shafting and pulleys. Reason for selling, replacing by a larger machine. Will sell cheap to prompt buyer. Apply to "Paper Manufacturer," care Pulp and Paper Magazine, Toronto, Canada.

PAPER STOCK MARKET. REPORT.

Montreal, Feb. 16, 1907.

The paper stock market, on the whole, is in a strong position. Wood pulp is both high priced and in some cases difficult to obtain. The demand for manufactured paper is good, and as reserves of paper stock, laid in at the close of navigation become depleted, manufacturers turn their attention to stocks in the hands of domestic packers.

There is a good enquiry in nearly all lines, with the exception of new cuttings, the supply of which appears to be in excess of the demand. Cotton rags and waste papers of all grades are moving freely and roofing stock is closely bought up.

There is not much doing locally in manilla rope or bagging, but foreign reports indicate that both these, especially rope, are advancing in price.

Quotations are as follows:—

No. 1 white shirt cuttings	$5.00	to	$5.50
Light print cuttings ……	4.00	to	4.50
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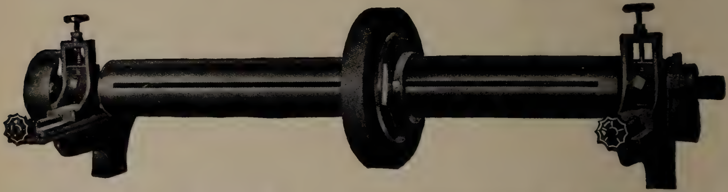

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FOR SULPHITE AND GROUND WOOD PULP MILLS

Only best of stock is used in making these goods. I am supplying some of the best Mills in Canada, among them being, The E. B. Eddy Co., Hull; J. R. Booth, Ottawa; James Maclaren Co., Buckingham, Que; Nova Scotia Pulp Co., N.S.; Lake Megantic Pulp Co., Lake Megantic, Que.; A. J. Morrill, Nicolet Falls, and others.

A trial order would be appreciated.

HULL WOOLEN MILLS, HULL, P.Q.

STUFF PUMP

This pump is made in three sizes, 5", 6" and 8".

The valves are made so as to be easily and cheaply replaced and can be got at without using wrench.

We also make boiler feed and other pumps.

Particulars and references on request.

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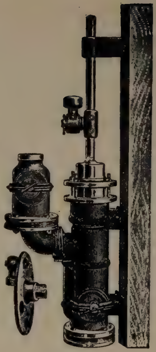

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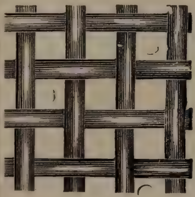

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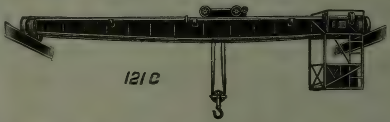

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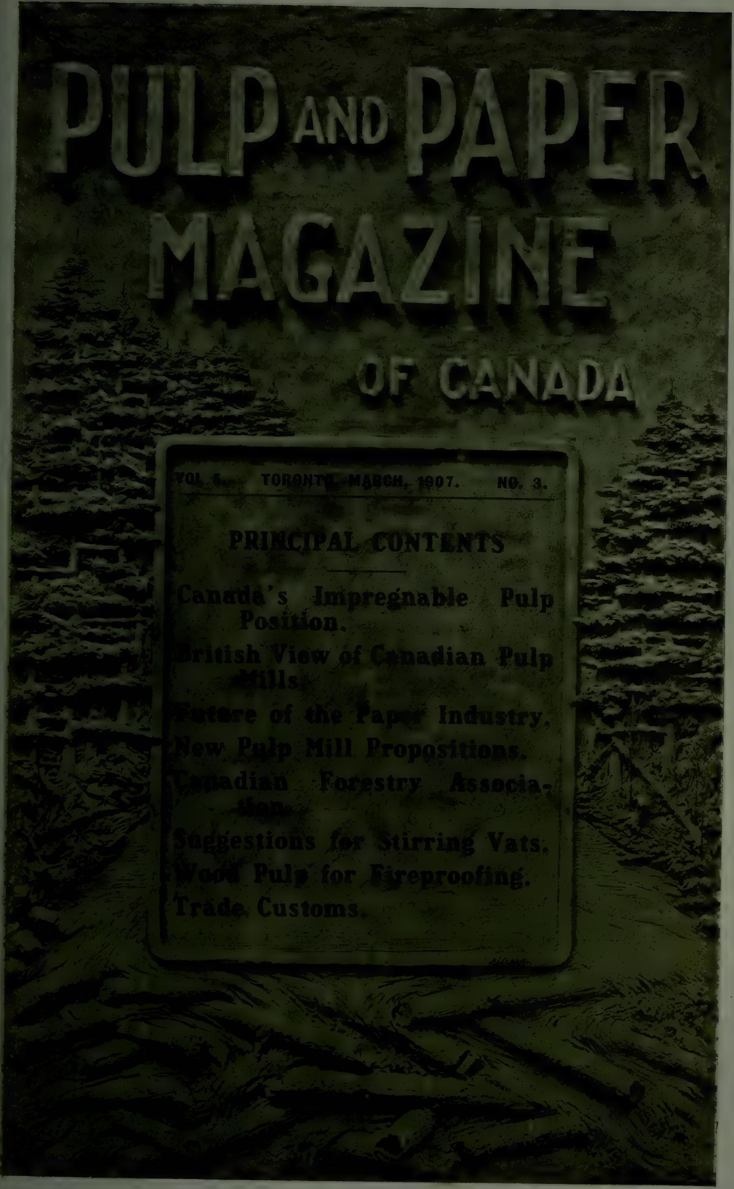

PULP AND PAPER MAGAZINE OF CANADA

VOL 5. TORONTO, MARCH, 1907. NO. 3.

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British View of Canadian Pulp Mills.
Future of the Paper Industry.
New Pulp Mill Propositions.
Canadian Forestry Association.
Suggestions for Stirring Vats.
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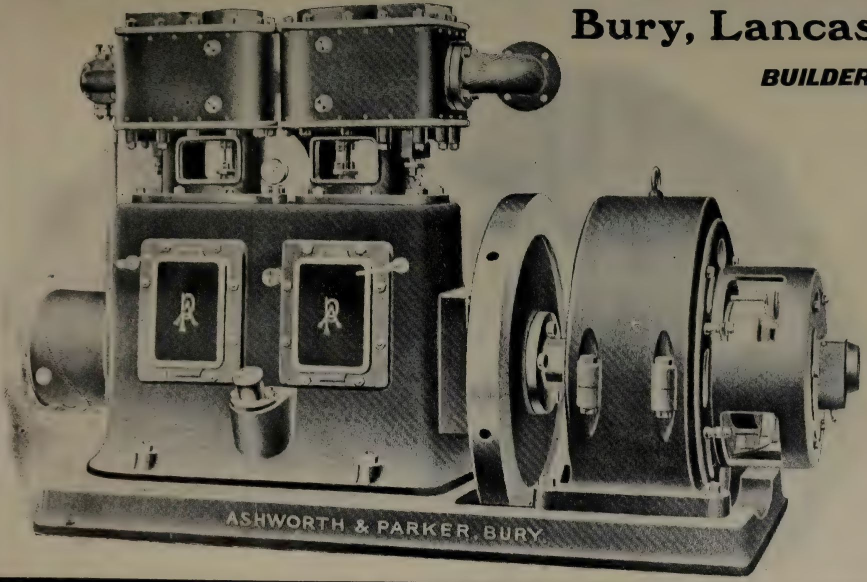

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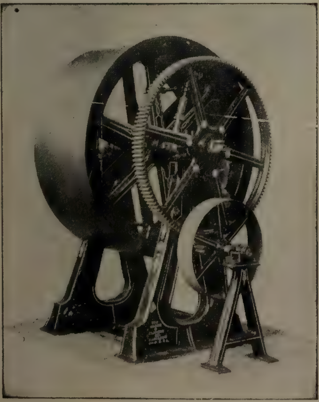

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PAPER TRADE IN SWEDEN.

The Canadian trade agent in Sweden sends in a report as follows:

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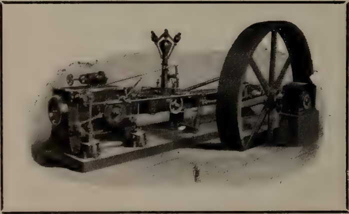

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THE
PULP AND PAPER MAGAZINE
OF CANADA

VOL. 5.—NO. 3. TORONTO, MARCH, 1907. $1 A YEAR
SINGLE COPY 10C

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade.

SUBSCRIPTIONS: Canada, British Empire and the United States, $1 a year; to Foreign Countries, 5s. a year.

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CANADA'S IMPREGNABLE PULP POSITION.

The news that came to us recently from Wisconsin that paper manufacturers there were finding pulpwood so scarce that they were importing 100,000 cords of peeled spruce from Quebec, gives one some idea of the conditions with which the West is confronted in respect to raw material. It should be sufficient also to make Canadians grasp the significance of their own strong position in the world's pulp and paper industry. One handicap under which the Wisconsin mills have been suffering has no doubt been the scarcity of labor, a drawback which is affecting the industry in this country also. But a still more important feature of the situation is the fact that the saw-mills are actually now in the market for pulpwood, and that whereas formerly the only bidders for small stuff of six inches in diameter or thereabouts were the pulp mills, that material is wanted now for lumber purposes as well. Of course the double demand, coupled with the scarcity of the article, gives it a higher value. Pulpwood, f. o. b., G. T. R. cars on the South Shore and also east of Quebec, on the Intercolonial is realizing $7.00 to $7.25. Added to all these factors of a higher range of prices has been a very serious shortage of cars.

It is highly significant that these Wisconsin paper manufacturers are going to Quebec to get their pulpwood, and having to haul it a thousand miles or more. Ontario is much nearer, but that Province is not giving up its pulpwood from Crown lands, owing to its prohibitory law on that point. Quebec may well pause and consider why it should allow American mills to ravage its timber limits.

The pulpwood resources of Quebec are very large. They have been called inexhaustible. But if such qualification can be appropriately used, they are in fact only "comparatively" inexhaustible. Canada, without a doubt, has the greatest bodies of good pulp lands in the world, and yet, unless these resources be carefully guarded, they are likely to go the way of other "inexhaustible" resources. In Wisconsin, a very few years ago, it was the popular belief that they had enough timber and pulpwood to last for fifty years; yet, already the mills are finding the greatest difficulty in obtaining supplies.

Even in Quebec some shrewd observers are beginning to doubt whether the quantities of available wood have not been over-estimated. In some cases perhaps, glowing reports have been published by men whose qualification for sizing up the quantity of marketable pulpwood and separating it from other wood was somewhat limited. Much of this, too, is situate on streams flowing towards the north, which cannot be got at until railroads are built. In the case of some 8-inch samples taken, waist-high, from trees in that region lately, it was found that they contained no fewer than 100 rings. This means that those trees had taken 100 years to grow, their slowness being due to the cold, short seasons and the swampy muskeg land. When reproduction is talked of this is a fact that will have to be borne in mind.

However, with all possible limitation of Canada's pulpwood resources, the fact remains that this country is the only possible great source of supply left for this continent. There are mills in Wisconsin and other States which do not own a single stick of pulpwood, but have to buy it in the open market. There would have been long before this a positive famine in sulphide pulp in the United States, had it not been for large importations from Europe. The idea is rapidly growing that Canada should prohibit the export of this raw material, the value of which she largely loses thereby. It is necessary for the continuance of her present tremendous natural advantage in the possession of a resource which has been ruthlessly wasted in other parts of the continent, that steps should be taken without delay for its proper conservation. The United States understands the force of this contention and should not object to its being carried out, as it is really a case of self-preservation.

⁂

CAR SHORTAGE.

No small part of the difficulty experienced by the pulp mills during the past few months in getting sufficient supplies of raw material may be set down to deficiencies in railroad management. The production has been curtailed and to some extent the prices enhanced by the fact that cars to bring pulpwood to the mills have been unobtainable at any cost. In the northern districts of Ontario and Quebec there are piles of pulpwood awaiting cars, while in some cases loaded cars have been kept for several days waiting for engines to move them. Canadian railroads complain that they cannot prevent the congestion; that it is universal and just as bad across the border. It is true that similar complaints come to hand from many parts of the United States—New York, Wisconsin and so forth. This is an indication, no doubt, of the extraordinary prosperity and rush of business all over the continent, but the state of things across the border is not much excuse for that which prevails on this side. Railway men, moreover, retort by claiming that even the cars which are available are not made proper use of by shippers, but are used in demurrage in default of sufficient warehouse room.

But their chief defence is that they did not foresee such a remarkable development of business as has taken place. If the railroads, foreseeing a depression, had made retrenchments and been proved right, what Solomons of far-sighted judgment they would have been proclaimed. Now that they are proved not to have foreseen the true situation (or so they claim) they must expect to receive compliments of a converse description.

It is a strong commentary on the above remarks that Eastern and Western members of the American Pulp and Paper Association met together in Chicago on the 12th inst. and concluded to advance prices as a result of the congested condition of the railroads and shortage of cars.

* * *

CANADIAN PULP MILLS FROM A LONDON STANDPOINT.

The "London Financier," of whose articles on Canada's pulp and paper prospects we had something to say in our last number, sums up the matter as follows:

"It is beyond all question a truism that the pulp and paper industries of Canada have a great future. The misfortunes of the past are characteristic of early developments in nearly every industry which attracts the attention of outside investors, and somehow or other the lessons dictated by misfortunes and bitter experience seem easily forgotten. The pulpwood, wood pulp and paper-making industries of Canada unquestionably possess magnificent prospects, and in the not distant future will present numerous desirable openings for the remunerative employment of British capital."

The financier thinks that this will be still more noticeable when Canada cultivates the British market for wood pulp more assiduously than she has done in the past. Only a comparatively small proportion of Canada's manufacture of "news" goes to Britain, though, as our London contemporary remarks, "there is every desire on the part of British paper makers to consume Canadian pulp."

The "Financier" agrees also with an opinion laid down in these columns on more than one occasion; that is to say that no pulp mill should start up under present circumstances without possessing pulp lands of its own. Moreover, it is useless to attempt a big pulp and paper-making industry from a City of London board room, without having first-class managers, practical men, to look after the business on the spot.

* * *

THE FUTURE.

The following is what a Swedish authority, the "Svensk Pappers Tidning," has to say on the subject of future prices likely to prevail in the paper and pulp industries, and is interesting as representative of the European view:

The prices obtained by paper-makers have been falling for years. It is true that there have been temporary rises, but they have been small, and never lasted long. That the prices necessarily fell below the standard they reached in the seventies is easy to understand, for since that period wood pulp has come on the market as a raw material for paper-making. Although this new material became cheaper as its production increased, the consumption soon grew so tremendously that prices began to set the other way. We may recall that in the early seventies Swedish-made sugar wrapping-paper cost about 8d. per pound, and Swedish buyers of that paper thought they had done well if they got it from abroad for 6d., and that as early as 1876 soda cellulose was only 18s. per cwt.—a price then regarded as excessive.

Another reason for the depreciation of paper is to be found in improved manufacturing methods. The output increased and the factories developed a tendency to confine themselves to special qualities. As regards raw materials their minimum in price seems to be near at hand, and there is no present prospect of future improvements in manufacture which will further bring down the selling price of paper. The unfortunate part of the situation is that the makers are beginning to accept it with pious resignation, and have neither the courage nor the co-operation necessary to improve it. When we consider that raw material, plant, and labor, all necessary to the paper-maker, show a gradual rise in the total cost of production, in spite of a few small movements here and there in the direction of cheapness, the necessity for some combination on the part of paper-makers to raise their prices becomes evident.

At present the most important raw material is wood. No fall in the price is to be hoped for. On the contrary, it is certain that its cost will keep pace with the demand, and the paper-maker is thus face to face with increased prices for his chief raw material. Rags are scarce and dearer. Rag collecting seems to be going out of favor, so that the business is much neglected. It is to be feared that many rags which in past years reached the paper mill are now wasted in the streets or cremated in the refuse destructors. Another important factor in rag prices is the recent entry of the United States as a rag buyer on to the European market. This has, of course. increased the price of European rags to European paper-makers, and to such an extent that rag-made paper bids fair to become a rarity.

Straw and esparto and the less important paper-making materials all tend to rise in price to a great extent, no doubt on account of the increased demand for them caused by the higher prices demanded for wood and rags. Even rosin, felts, and other accessory but yet indispensable products are getting dearer and dearer. The connection between the price of rosin and that of wood pulp is obvious, but it has never yet been worked out. Some investigations in this direction are urgently wanted. The constant tendency to increased cost of labor has been already alluded to, and is yet another factor in the problem. Enough has been said to show that the position of the paper-manufacturer is a very precarious one, although he belongs to an enormous industry which is indispensable to modern progress and prosperity.

CANADIAN FORESTRY ASSOCIATION.

(From a Special Correspondent of the "Pulp and Paper Magazine.")

Ottawa, March 15, 1907.

This is the eighth annual convention of the Canadian Forestry Association, and each year has shown a notable growth of public interest in the doings of its members. Not only so, but a still more important point may be noticed, namely, the increasing respect with which the ideas of the association are being treated by practical lumbermen. In fact, it is being more and more realized that lumbering and forestry and silviculture are all so closely interrelated that they cannot be separated the one from the other without mutual injury. The practical lumberman of to-day is different from his brother of yesterday. He is more truly practical in that he recognizes the value of a little theory to "true up" old rule-of-thumb methods; nor is he any less so because he sees plainly enough that unless some check, such as is offered by plans of forestry, is quickly put in force, there will soon cease to be any timber on which to try either his actual cutting or the forester's theoretical saving. The change of attitude is aptly indicated in Senator Edwards' announcement that on a 1,600-mile limit in Gaspé he intends cutting each year only a small percentage of the available timber, and to constantly replant the despoiled area. This is the best possible kind of forestry conservation, the other branch, of course, being reforestation. In Canada to-day there is ample room for both. This being so, it is no wonder that a growing proportion of the general public is likewise to be found interesting itself in the main concerns of forestry, and it is no wonder that the Association membership at this time numbers 1,222, a gain of no fewer than 875 members within five years. That body and the nation at large owes a debt of gratitude to E. Stewart, the organizer of the C. F. A.

But while progress has been satisfactory in some respects, it really only serves to throw a clearer light on the enormous work still before the people of Canada if they will succeed in conserving, without undue waste, the great resources that nature has given them. Mr. Stewart's suggestion towards this end was that in granting patents on wooded lands, the Government should reserve 10 per cent. as a wood lot. In the western prairie country, out of 9,000,000 trees planted within the last few years, at least 85 per cent. have thriven.

Prof. John Macoun sounded a note of warning based on what he saw on the eastern slope of the rockies, twenty-eight years ago and what he sees now.

All sorts of proposals were made for the proper preservation or re-seeding of Canada's forest belts. H. Lovell, one of the oldest lumbermen in the country, suggested the utilization of prison labor for the reforestation of eastern wooded lands. W. J. C. Hall, Superintendent of Forest Reserves in Quebec, stated that an order-in-council would very shortly be passed creating a reserve from the Riviere du Lièvre to the Ontario boundary. W. B. Snowball gave an idea of what was being accomplished in New Brunswick.

A feature of this year's convention was the form taken by the discussion. Certain subjects were started, and then the ideas of other members requested on the named topics—symposium fashion. Thus on Thursday afternoon, Senator W. C. Edwards gave a thoughtful address on various branches of that important question—"Should settlement be allowed on timbered lands and on what conditions; the diameter limit for cutting; methods of reproduction." He was followed by perhaps a dozen other speakers, so that the subject was thoroughly threshed out in all its bearings.

On the next day, the more purely horticultural side of the forestry question was taken up by W. T. Macoun, of the Central Experimental Farm. How, when and where to plant young stock, and of what varieties it shold be to suit certain varied conditions, were dealt with not only learnedly but enjoyably.

A feature of the convention which all the members enjoyed and many outsiders, was the lecture by Dr. B. E. Fernow, Principal of the Forest School of Pennsylvania, on "The Aim of the Forester," illustrated by lantern slides. It was a good resumé ot the arguments which had been heard in the previous part of the day, to the effect that forester and lumberman were really one in their aim, however much they differed in present or rather past methods

Officers were elected for the current year: President, H. M. Price; Vice-President, W. B. Snowball; Secretary-Treasurer, R. H. Campbell.

This short sketch of the proceedings of the convention may well be concluded by the reminder that every one interested in forestry may become a member of the Association and obtain full particulars by applying to R. H. Campbell, Ottawa, its indefatigable secretary.

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—The annual meeting of the Canada Paper Company was held in Montreal on the 12th inst., when the following were elected directors: Sir H. Montagu Allan, Messrs. H. S. Holt, Bryce J. Allan, Hugh A. Allan, C. R. Hosmer, H. Markland Molson and the Hon. Robert Mackay. At a subsequent meeting of the directors, Sir. H. Montagu Allan was elected president, H. S. Holt, vice-president, and F. J. Campbell was re-appointed general manager. The past year has been a very good one for the company, whose business has increased over twenty-five per cent.

THE GREAT CLAY BELT.

Reports from travellers through the country north of the Height of Land in Northern Ontario and west of the Quebec boundary are now so numerous and so similar in character that it is safe to take what they say as a very fair approximation to the truth. This truth is important, not only from a national point of view, because it means a great deal to Canada to have its eastern and western regions united by a populated belt. but also to the pulp industry which depends for its future well-being largely on what reserves of material can be relied on as existing in these northern districts.

The district stretching westward from Lake Abitibi, which is on the Ontario-Quebec boundary, is called by the Grand Trunk Pacific surveyors, District D, and of this the engineer in charge says:

"In general the country through which the line passes in my district, especially the eastern 150 miles and along the northern projected route, is well adapted for settlement, the soil being of a rich clay loam, the timber being mostly poplar, spruce, white birch and balm of Gilead, the latter growing especially along the river banks. From the reports gathered it would be premature to come to any definite conclusion as to the producing capabilities of the great unopened country lying to the north, but I have not the least hesitation in saying that there is a fertile belt of land extending from twenty-five to seventy-five miles on each side of the projected line capable of supporting a very large population."

A report on the region surrounding Lake Abitibi states that much of the land is covered with timber, and that where the land is poor it may be kept in timber. It goes on to say that spruce. white poplar, birch balsam and tamarac. with a few white and banksian pines on the light or sandy land, constitute the forest of the township. There are a few cedars in some of the swamps, but these are of little or no commercial value. The spruce is nearly all good, clear timber, varying from four to fifteen inches in diameter, with scattering trees up to twenty-four inches in diameter. The larger of these will make good lumber and building timber, while the smaller can be utilized as pulp-wood. The white poplar is quite abundant, and from six to twenty-four inches in diameter. The tamarac is nearly all dead. The other kinds of timber are not very abundant. and of little commercial value.

The Grand Trunk Pacific will traverse all this district from east to west and will open up an undoubtedly valuable country. Usually, the land lying around the headwaters of the streams is not fitted for agriculture and if this is kept as a permanent forest reserve the logs may be floated down the streams to the railway where factories may be located to work them up into lumber, furniture. pulp or paper, or whatever else the timber may be fitted for. Thus the railway will traverse an agricultural district drawing freight from both sides, while the streams will carry down the products from the hills and furnish the power to turn these forest products into manufactured material.

SUGGESTIONS FOR STIRRING VATS.

Anyone comparing the old wooden vats still used occasionally with the modern cement vats will find that the latter have several advantages, remarks "Papier Fabricant." In the first place, the wooden vats, which have the form of a truncated cone with a vertical axis, and narrowing upwards, are harder to empty than the cement vats, which have a bottom sloping in all directions towards an outlet. Again wooden vats require more frequent cleaning than cement vats. The time between two successive cleanings may be put roughly at two weeks for a wooden vat and nine or ten weeks for a cement vat. Wooden vats cost more for repairs than cement vats, and then do not last as long. A wooden or any other vat with a vertical axis has the disadvantage that gravity does not assist the mixing action of the stirrer so effectually, so that the axis of the stirrer should always be horizontal. This is easily seen by comparing the time which a vertical stirrer takes to mix in dye with that required by a horizontal stirrer.

Whatever may be the construction of the vat, great care must be taken to make its interior free from corners and projections, which will only serve to impede the stirring and to form refuges for particles of pulp. The stirring must be managed, besides, in such a way that no lumps are formed, and that the process goes on with perfect smoothness, which cannot be the case if the rouser blades come into contact with entangled masses.

As material for the blades of vertical vats pine wood has proved suitable. The blades should have two or three coats of red lead. An arrangement which mixes well and requires less power than most others is to arrange the blades spirally on the axis and to connect their ends with iron bands or laths painted with red lead. The stirrer has then a screw-like action. The blades may be of iron or wood, but care should be taken that they have ample strength.

In horizontal vats—especially in the manufacture of fine papers—it is usual to enclose the axis in a copper pipe, to prevent it from rusting and so spoiling the paper. The vat itself is commonly lined with tiles, with the same object. If the vats are very long, the stirrer-shaft should be supported in the middle with a bearing if lignum vitae, supported by a V iron, protected from rust by a wrapping of wire covered with cement. In the older forms of vat the ends were provided with arangements which were a combination of stuffing-box and bearing; but nowadays the bearings and the stuffing-boxes are separate. The stuffing-boxes are best packed, experience has shown, in tallowed hemp packing of square section. Care must be taken in laying down a horizontal vat that there is sufficient floor space to permit the removal of the rouser-shaft, as that is sure to be necessary sooner or later.

The ladles are preferably made of copper, and can be coated with lead if the pulp is very acid. Leaded copper also makes good ball valves for the pumps.

Many methods of driving the stirrer are in use. The commonest is by bevel gearing, both for horizontal and upright vats. Belt driving with a fast-and-loose pulley and a tork is recommended by many.

Worms and worm-wheels, when used with horizontal vats, have the drawback of waste power, as the position of the vat entails great friction. If a chain and sprocket gear is adopted, care must be taken to keep the chain well lubricated, or it will wear rapidly and waste much power. Purely friction gear is not to be thought of for stirring vats, as the vats are liable to throw themselves out of gear, whereby variations in the weight of the paper ensue.

The special kind of drive to be adopted must depend upon the circumstances of the case. In any event, care must be taken that no dirt or lubricating oil can get into the vat from the machinery. For this reason upright vats are usually driven from below, so that any dripping oil falls away from the vat, and not on to it. In this case, it is important that the gear-wheels should not be difficult of access, so that repairs may be quickly executed. There should be plenty of room below and around this gearing. It will be found economical in the long run to have gear-wheels of cast steel, and to keep duplicate parts always in stock. The speed of the stirrer depends upon the character of the pulp. It is evident that if it contains much clay and other filling, as in the case, for example, with printing and wall papers, the rotation must be faster than with a pure rag pulp. The limits may be put at three and eight revolutions per minute.

PULP AND PAPER NEWS.

The Ingelwood Pulp and Paper Co., Musquash, N. B., have built a new sawmill.

* * *

A large storehouse of the Riordon Paper Mills at Merritton, Ont., has been destroyed by fire.

* * *

The Eastern Pulpwood Co., St. John, N. B., is confining its operations around St. Croix this year to poplar.

* * *

Newsome & Gilbert, Limited, Toronto, manufacturing stationers, capital $100,000, has been incorporated.

* * *

The premises of the Guelph Paper Co., Guelph, Ont., were damaged by fire this month; covered by $4,000 insurance.

* * *

The Bury Pulpwood and Lumber Co., Hereford, Que., have dissolved, Thos. H. Vandike and Samuel E. Watts continuing the business.

* * *

Standard books and the better kinds of school books are likely to be increased in price, owing to the advance in bindings, paper and printing.

* * *

The premises of the Quebec "Daily Telegraph," owned by Frank Carrell, were last month destroyed by fire. The loss was $100,000; fully insured.

* * *

The Newfoundland Government is negotiating with the Harmsworths for the further extension of the pulp and paper industries contemplated on the Exploits River.

* * *

It is announced by the Ontario Government that the remaining $1,000,000 guaranteed loan on account of the Consolidated Superior Corporation will be repaid by April 1st.

* * *

The Riordon Paper Mills at Merritton, Ont., were closed down for a day or two this month, owing to insuffiency of logs. They are now running full blast again, however.

* * *

The British Canadian Lumber Co., Ltd., has received a British Columbia charter authorizing it, with a capital of $1,000,000, to purchase wharves and other means for holding and shipping pulpwood.

* * *

The Hugo Ross Realty Co., Ltd., has been incorporated under British Columbia laws, with a capital of $100,000. It will construct and operate works for storing and delivering pulpwood and other lumber.

* * *

The Hill-Tout Lumber Co., Ltd., capital $50,000, has been incorporated under British Columbia laws. It has power to construct or lease or otherwise acquire and operate sawmills, pulp and paper mills, &c.

* * *

The Edward Partington Pulp and Paper Co., who, it will be remembered, recently took over the Cushing Sulphite Fibre Co.'s mill at Mispec, N. B., are now operating it. H. W. Schofield continues as secretary-treasurer.

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La Compagnie Marchand Freres, Montreal, capital $20,000, has been incorporated to print and publish papers, manufacture paper, envelopes, paper boxes and bags. O., W., and A. Marchand, of Montreal are members.

* * *

The Boundary Lumber Co., Ltd., capital $200,000, has been incorporated under British Columbia laws for the purpose of manufacturing, preparing and dealing in pulp and other articles in which wood is used, stone, cement, &c.

* * *

The Burrard Lumber Co., Ltd., capital $150,000, has been granted a British Columbia charter authorizing it to grow, prepare for market and deal in lumber, pulp and paper of all kinds, build and operate pulp and paper mills, &c.

* * *

Hon. A. J. Matheson, Treasurer of the Province of Ontario, announces his expectation of receiving the following amounts from woods and forests out of a total revenue of $7,612,000: timber dues, $1,300,000; bonuses, $350,000; ground rents, $65,000.

* * *

"L'Imprimerie," Yamaska, St. Hyacinthe, has been incorporated under Quebec charter with a capital stock of $10,000 for the purpose of printing and publishing newspapers and other periodicals. D. T. Bouchard, A. Messier and A. Bonnet, of St. Hyacinthe, are charter members.

* * *

The Rice, Barton & Fales Machine and Iron Co., Worcester, Mass., have secured exclusive right to manufacture their patented appliances, and are now the exclusive builders of the Smith Patent Calender Feeds, Patent Diagonal Cut Screen Plates, and Patent Centrifugal Agitators.

* * *

The Queen City Trading and Transportation Company, Limited, capital $20,000, has been incorporated for the purpose of carrying on business as timber merchants, saw-mill and pulp-mill proprietors, and to manufacture and prepare for market wood and articles in which that material is used.

* * *

The old Montreal River pulp concession which, it will be remembered, was taken from its original holders because of non-fulfilment of conditions, has now been resold for a bonus of $300,000 and dues of 40c. per cord on pulpwood and 20c. on jack pine. Mills will be built in Ottawa.

* * *

The Dancyger Safety Pin Ticket Co., incorporated under Ohio laws, has been authorized by the Ontario Government to manufacture and deal in all kinds of tags, tickets, labels, paper, cardboard &c. The company's agent in Canada will be W. W. Vickers, Toronto, and the capital authorized, $30,000.

* * *

The Buckingham, Que., strike case was again up in the courts this month. Alex. McLaren, Constable F. Kiernan and Bailiff Cummings, beside six detectives, charged with manslaughter, owing to their alleged share in the fatal riots, were all honorably acquitted, the judge charging that they had evidently only acted in self-defense.

* * *

The announcement that the Quebec and Lake St. John Railway has been acquired by Mackenzie and Mann is of interest to the pulp industry, on account of the large areas of pulpwood located along the line. It is stated that the Canadian Northern will improve the road and extend it from Roberval to James Bay.

* * *

The Canada Exploration Co, Montreal, capital $250,000, has been incorporated. Among the powers granted to it by the Dominion Government is that to acquire, operate and deal in timber lands and limits, pulpwood concessions, &c. E. F. Surveyer, J. W. Weldon, E. M. McDougall and S. J. Le Huray are charter members.

* * *

Alexander Gibson, long known as the Lumber King of New Brunswick, but also well known in the cotton trade as proprietor of the Gibson Cotton Mill at Marysville, N. B., is seriously ill at his home in Marysville from an attack of pneumonia. As Mr. Gibson is in his 87th year, it is feared that he may not be able to survive his present illness.

* * *

Imperial Paper Mill matters have been before the courts for some time past but no great developments have taken place. John Craig, one of the receivers, was in this country on a business visit, but has now returned. Leave has been given by the Toronto court to borrow $20,000 to pay insurance on the Imperial Paper and Northern Sulphite Mills.

H. L. Sprague, of New York, assignee of A. L. Myer and W. Seward Webb, is suing J. R. Booth, of Ottawa, for $2,000,000 for alleged breach of contract in connection with the Canada Atlantic Railway. Webb deposited $250,000 for the purchase of the road, but failed, it is alleged to put up the balance of the money, and Mr. Booth then held the deposit as forfeit.

* * *

The Campbell-MacLaurin Lumber Co., Ltd., has been incorporated under a Dominion Charter, with a capital stock of $100,000. With other powers it is authorized to manufacture and sell pulp and paper. A. H. Campbell, of New York, Alex. MacLaurin, of Montreal; C. J. R. Bethune, F. H. Crysler and N. G. Larmouth, of Ottawa, are charter members.

* * *

E. Stewart, late Dominion Superintendent of Forestry, states that along the MacKenzie River spruce grows clear to the Arctic Ocean. There are aspen, white poplar, balm of Gilead and birch growing as far north as Fort MacPherson. At the junction of the Peace and Slave Rivers timber grows as large as fourteen inches in diameter, diminishing in size to the north.

* * *

The plans of the Grand Falls Power Co., who own rights for the development of water power at Grand Falls on the St. John River, are approaching completion under the superintendence of A. C. Rice, of Worcester, Mass. Dams are to be built in close proximity to large forests. The company intend to build a transmision line from their plant to St. John, about 160 miles away.

* * *

The Ontario Government has sold 36 square miles of pine in Algoma, close to the Algoma Central Railway, to E. B. Foss & Co., of Thessalon and Bay City. There were twelve tenders sent in, the successful one being at the rate of $10.52 per thousand b. m., with $2 extra for dues, or $350 per cubic thousand, with $50 for dues. This will fix the future price for the railway company.

* * *

A deputation comprising J. R. Booth and several other prominent Ottawa Valley lumbermen waited on the Dominion Minister of Public Works last month and asked for the construction of a dam on French River, in order to establish a minimum level for Lake Nipissing. They pointed out that this work, while costing little, would be of great benefit to pulp manufacturers and lumbermen.

* * *

T. J. Marshall & Co., Campbell Mills, Stoke Newington, London Eng., makers of dandy rolls and bank note moulds have sent out their 27th annual calendar in which the lettering is entirely done with watermarking. It is an interesting novelty, and is unique as a calendar. This old established firm have just placed on the market an improved bleach detector, a small and simple device which should be indispensable in every bleach house. Instructions for its use are given with the circular describing it.

* * *

St. John, N. B., City Council have agreed to make a change in the terms of the lease of the Mispec Pulp Mill. The proposal is for the company to retain possession of the pulp mill at the present rental, but to let the lessees have it from one to ten years at their option year by year. At the expiration of ten years the lease to be renewed in terms of five years at the option of the city. The lessees to purchase the city's interest at any time upon a price to be fixed by arbitration. The lessees not to be given any right nor any definite quantity of water.

* * *

The Northern Engineering Works, crane manufacturers, Detroit, Mich., are completing an addition to their plant, consisting of an erecting building for trolleys about 50 ft. by 100 ft., one storey, served by a ten-ton electric traveling Northern crane. Also a two-storey addition to serve as a tool room and store room, approximately 30 ft. by 50 ft. The buildings are of brick and steel construction with saw-tooth roofs, and are practically completed. The new additions will enable this company to handle their rapidly increasing electric crane business more rapidly, and will quite largely increase the output of the plant.

* * *

According to the Canadian Commercial agent in Japan, the paper makers in Japan are complaining that they are in an awkward position on account of the competition of imported paper. The demand for foreign-made paper continues to increase, owing to its lower prices, and the importation is steadily increasing. The Japanese paper mills have to pay a high price for pulp, and therefore cannot undersell the foreign goods. Many mills have been extended and their output is glutting the market, and as they cannot hold they are selling at a loss. The supply of raw material for Japanese paper is failing, and the price is rapidly going up.

* * *

The Canadian Pacific Sulphite Company's affairs were brought up again before the London, Eng., Chancery Court last month. Mr. N. Craig asking the court to sanction a special resolution, extending the provisions of the memorandum of association of the company, by giving the company water powers. The company had acquired all the shares in the Oriental Sulphite Pulp Company, and was really carrying on the business of that company in Canada. They wanted, however, to be registered with water powers in Canada, so that they could do the business there direct. The court sanctioned the petition, subject to further affidavits being produced.

* * *

T. J. Marshall & Co., Stoke Newington, London, inform us that the miniature paper machine which they built first, and which has been described by the "Pulp and Paper Magazine," has been sold to Mr. J. Stewart Remington, of Aynsome, Grange-Over-Sands, Lancashire, a well-known technical expert. Mr. Remington has expressed his great approval of the machine, and the other day gave a very flattering testimonial of its merits for transmission to the International Paper Company of Glen's Falls, New York, who have inquired about the machine for their bureau of tests. Messrs. T. J. Marshall & Co inform us that business is fairly flourishing in the English paper trade, and they have plenty of orders in hand and in prospect.

* * *

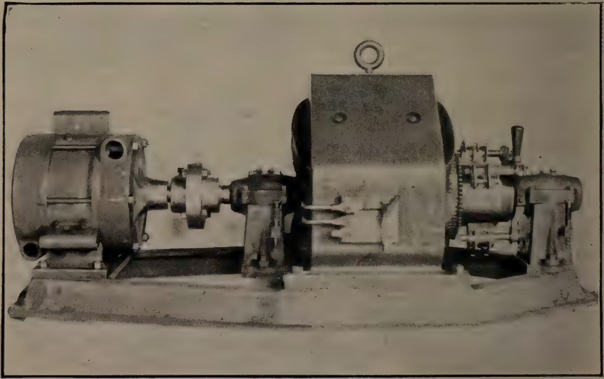
It was announced from Boston a few days ago that the long-talked-of re-organization of the Royal Paper Mills, East Angus, Que., had been effected through a consolidation of that company with the Brompton Pulp and Paper Company, of Brompton Falls, Que. It was said to have carried through by the efforts of Geo. Van Dyke, of Boston, E. P. Lindsey, Boston, and W. N. Monroe, Geo. Bearse and J. F. Wilson, of Lewiston, Que. The amount stated as being involved was nearly $3,000,000, and the intentions of the merged companies to acquire 150,000 acres of timber lands on the St. Francis River. The re-opening up of the Royal mills will be a great boon to the people of East Angus. The deal was apparently to have been carried through at a meeting in Sherbrooke on the 2nd inst., but it was postponed until the 19th, at the expiration of which time, if the money is not forthcoming, the deal is to fall through. We have received word from Sherbrooke that those in close touch with the purchasing syndicate believe the negotiations will be carried through successfully.

THE OTTAWA-HULL MILLS.

The pulp and paper mills at Chaudiere Falls are still materially handicapped by the low water. When a representative of the "Pulp and Paper Magazine" visited those industries last week, the Booth pulp mill was not running, and the Eddy mill was only running half time. Two of the Booth paper machines were in operation, turning out news of a very fine appearance and good quality. It is expected that the third machine will be put in commission very shortly. Plans for the new Booth sulphite mill are being prepared. Mr. Millen, the genial manager of the Eddy Co., told the "Pulp and Paper Magazine" that no special enlargement of the pulp and paper mills was contemplated at the moment though plans of considerable importance were under way in the match manufacturing branch. Business was very good, though the manufacturing end had been interfered with by the above mentioned cause.

EVANS ROTARY ENGINE.

There is now under successful test in Toronto a new type of engine which, for its simplicity of design, low cost, absence of friction, economy of fuel consumption, and compactness, should be particularly welcome in factories, and wherever efficiency, combined with smallness of space occupied, is a desideratum. The idea of a rotary engine is by no means new; indeed it appealed to the very first designers of steam engines. Until now, however, inventors have failed to obtain a mechanical construction which should insure economy in the consumption of steam.



25-H.P. Evans Rotary Engine Directly Connected to Electric Generator.

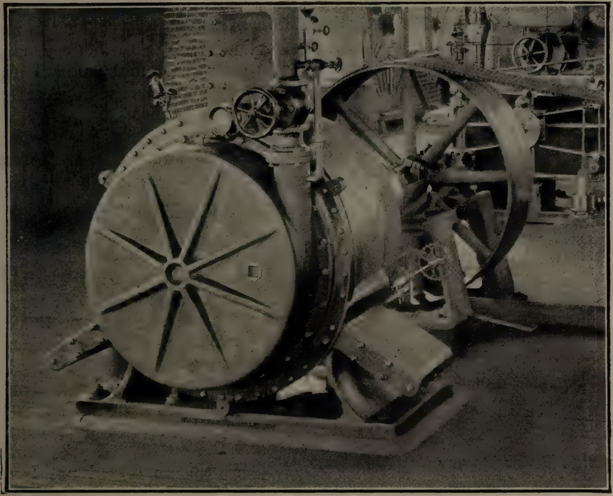
Mr. J. M. Evans has succeeded in making an engine in which the steam is used expansively under ideal conditions, with a minimum loss of energy, due to the use of a rolling piston and an actual crank in the cylinder and other novel features, thus saving all that amount of power which has to be expended by a reciprocating engine in overcoming the friction and momentum of numerous and complicated parts. At the very highest speed there is practically no vibration and no heat is lost in doing needless work. The piston plays with a continuous forward movement. A full crank leverage, therefore, is executed constantly; there is no dead centre.

In the Evans Rotary Engine, the steam valve consists of two parts, the disc and a sliding annular plate containing the same number of openings as the disc upon which it is carried, and adapted to be automatically rotated by a governor, or to remain constantly at a predetermined angle of cut-off as desired. In the latter case the cut-off may be varied while the engine is in motion ranging from the full opening of 120°, to a point where all but two of the openings are closed.

The working parts within the cylinder consists of the crank shaft which is built up, to allow of easily removing the working parts; the rolling piston journaled upon the crank pin and revolving upon the pin, with the outer circumference rolling in contact with the wall of the cylinder. Three division walls separate the cylinder into three 120° compartments, each of which has a separate steam entry and exhaust port. These ports are similar and are on alternate sides.

A balance plate of ordinary construction is used on the steam side of the division walls, to maintain tight pockets for the slides. The outer ends of these pockets are cored to form pneumatic chambers to receive and return the divisions, the pressure of air being calculated to receive and overcome the momentum of the slides and return them without undue force.

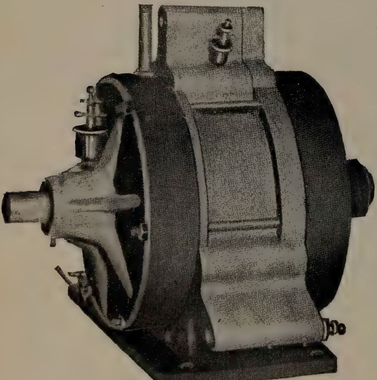
The piston is so arranged as to give a steam-tight joint of great flexibility, and allowing the sides of the shells to be held against the cylinder heads by the steam pressure in the chamber. As the steam and friction may be readily proportioned to each other on the principle of a balanced valve, it will be seen that the packings on all points of wear are steam-controlled, and that they will remain tight to the limits of wear; also that these limits are much greater than in the ordinary engine. The motion of the rolling piston is epicycloidal in all its parts, thus minimizing wear to a remarkable degree. Having an actual crank in the cylinder, the side pressure of the steam is taken off the shaft and utilized in holding the position against the cylinder walls, while any wear on the crank pin will not affect the working parts of the engine, as the piston is en-



500-H.P. Evans Rotary Engine.

tirely controlled by the steam and the cylinder wall. With one chamber exhausting, one with steam expanding and one taking steam at boiler pressure, or with two expanding, or in any other position, the resultant of the forces maintains the thrust always at right angles to the throw of the crank. The steam valve contains large flat surfaces and the valve seat and all moving parts of the steam cylinder are oiled by the oil carried in by the steam.

In starting, the engine takes steam at boiler pressure in two of the compartments at once, but as it gathers speed the cut-off reduces the angular opening of the steam admission valve until the cut-off attained is sufficient to carry the load at a given speed, after which the steam is used expansively, the reduced valve opening admitting steam to the various chambers in rotation. The engine will start with full boiler pressure on two chambers and cut off as speed is attained: this gives by actual test, when starting, a pull of about four times the power used when running regularly, a particularly valuable feature of reversing engines.



5-H.P. Evans Rotary Engine.

It shows an economical efficiency at speeds ranging from 20 to 2,000 revolutions per minute, and the same conditions exist under low and high pressure, ranging from 20 to 350 pounds per square inch. Having no dead centres, it will start under full load in any position, and is instantly reversible.

An idea of its marvellous simplicity of construction is shown in the calculation of the inventor, that an Evans Rotary Engine of a certain horse-power actually contains no more metal than the flywheel and crank shaft of the average reciprocating engine of equal power, and will show a saving in fuel of at least ten per cent. We need not enter into details as to what this means as to its usefulness as a power producer in mills and factories of all kinds, to say nothing of ships, mine elevators, automobiles, pneumatic tools, etc., also in direct connection with dynamos.

The Evans Rotary Engine Co. has an office in Manning Arcade, Toronto.

IMPROVEMENTS AT DAVY PULP MILL.

The Davy Pulp Mill, Thorold, Ont., has closed down for two or three weeks for repairs, a thorough overhauling and the installation of new machinery. Two large new grinders of the New England type, made by Olin Scott, Bennington, Vt., will be the principal large machines installed, with which it is expected to double the output of the mill. The former grinders turned out from eight to ten tons of dry pulp in a day, while the new grinders will turn out twelve or fifteen tons with ease. Two new pulp mixers of the latest improved type and other machines necessary are also to be installed. On the main floor of the mill a new concrete floor will be laid to accommodate the heavy machinery, while another concrete floor will be put down in the basement or boiler room. E. P. Foley, the manager, stated that the increase of the firm's output and business necessitated this move, and we believe that the company, previous to the shutdown, had been working overtime to fill orders.

ENGLAND REVISITED.

Correspondence of the Pulp and Paper Magazine.

Letter No. 3.

There is a pretty common impression among Canadian business men and manufacturers that the British manufacturer and merchant is behind the times. This impression is due, in great part, to the notions cultivated by the United States press, which, owing to the low postal rates obtained by American publications, circulate much more largely in Canada than English publications do, handicapped as the latter are by the prohibitive rates of 8 cents per lb. Why the British public, and especially that portion of it dependent on manufactures, have not long ago seen that this tax on their own literature is hurting their foreign trade, is a mystery to the average Canadian, but it is to be hoped that the new British Postmaster-General will not fight against such a reform as past Postmasters-General of Great Britain have. In consequence of the large circulation of American scientific and trade publications in Canada, Canadian manufacturers and business men have really come to believe that the leadership in science and industry throughout the world has been taken by the United States. They read comparatively little of what achievements have been made by Great Britain in this field. If this condition of things was reversed, the writer has no doubt whatever that millions of pounds worth of trade would be done every year by British manufacturers in Canada that is not done now. Americans are expert advertisers, and they let the world know in an attractive form by articles in the trade press and by handsomely illustrated catalogues what they are doing, and this education of Canadians is naturally leading trade towards the United States and away from Great Britain, as our trade returns amply demonstrate, in spite of the preference given in favor of British manufacturers.

The British manufacturer and merchant may be somewhat slow to catch hold of novelties, and still slower to adapt himself to changing conditions brought about by new machinery, but when he does grasp the significance of a new invention or new idea in trade, he has a grip that is firmer, and in the end he "gets there." If the Canadian is under the impression that the Briton lacks in enterprise, he has only to visit the Manchester docks, or take a trip down the Manchester Ship Canal, and enquire what are the results of that colossal enterprise. It is a magnificent example of the dogged courage of the Englishman and of his determination when he embarks on an enterprise to see it through. The cotton trade, before the establishment of the Ship Canal, was at the mercy of the railway companies in the matter of freight rates, and the Liverpool shipping interests in the matter of dock and warehouse accommodation. The people of Lancashire complained of the excessive rates charged on raw cotton and on cotton goods for the short distance between Liverpool and Manchester, but for years they could get no remedy. The people of Manchester finally decided to build a ship canal. It was a stupendous work to obtain the charter in the first place, owing to the strength of the railway influence in the British Parliament, but every obstacle was finally overcome, and in 1893 the canal was opened. For a long time it was a losing enterprise, because steamship lines had to be attracted to the new route, and this was a slow and tedious process. Without going into the history of the development of the trade by the ship canal, it is enough to say that to-day the traffic has grown till the interest charged against the Canal Company is more than covered, and the time is fast coming when it will yield a good profit, for to-day Manchester is in direct touch with the trade of the "Seven Seas." Even if profit were out of the question, however, Manchester and the whole of Lancashire are united in saying that the indirect benefit of the ship canal has justified the wisdom and courage of the original promoters. The cotton spinners and manufacturers, for instance, will all say that the saving in freights alone that have been achieved since the canal was in operation, have been equal to large profits on their operations. Even where the manufacturers have been large shareholders, their savings in the cost of transportation have far outbalanced the loss of interest on their individual investments in the ship canal in past years. The old rates, broadly speaking, have been cut in half by the establishment of the ship canal, and to-day one can get direct shipments to Manchester from every leading country in the world. One little instance can be given as showing how new lines of trade have been actually created by the ship canal. Before the canal existed, bananas were 6d. each, and this wholesome fruit was inaccessible to any but the wealthy of Lancashire. To-day one can buy bananas from vendors on the streets of Manchester and neighboring towns as cheaply as in Toronto or Montreal, and the poor cotton operative can have this fruit on his table as commonly as the well-to-do merchant of twenty years ago. The development of the oriental fruit trade has been enormous, and every one knows that such a thing could never have been thought of without the ship canal. A number of new lines of business have been opened up in the textile trades in the same way, which could never have existed in the days of the high railway freight rates. Cotton yarns are shipped direct from Manchester to mills in the north of Ireland to be made up into union linen goods, and cotton-piece goods are also sent to Ireland for the "making-up trade," and come back as ready-made garments, to be sold in North and Central England.

In like manner the pulp and paper trades are receiving enormous impetus in Central and North England, and every week shipments of both pulp and paper come and go throughout the Manchester canal. This has an important bearing on the benefits of the ship canal to Canada, and through the enterprise and alertness of the Canadian agents of the Manchester Ship Canal, the Manchester liners are receiving ever-increasing cargoes of Canadian pulp, paper, textile machinery, lumber, fruit, live stock, etc., at rates which give a fair return to the steamship companies, and yet yield a decided advantage to the exporters from both ends. The area of this new trade can be greatly extended in England, and the time may come when electric roads may transport goods north and south from Manchester in competition with old-established ports of the Kingdom, which have hitherto maintained a monopoly of the internal trade of other parts of the Kingdom. The writer would strongly urge manufacturers of pulp, paper and textile fabrics, both in Canada and Great Britain to study the revolution which this canal has already made in these trades betwen the two countries, with a view to improving their facilities and cheapening their exports and imports.

To those directly concerned with the shipping trades it is no news to be told that the results achieved in the extension of Canadian trade by the Manchester Ship Canal have been largely due to the ability and aggressiveness of the Canadian agents of the Manchester liners and the Canal Company; R. Dawson Harling, 28 Wellington St. E., Toronto, being the special representative in Canada of the Manchester Ship Canal Co., and the agent of the Manchester liners in Canada, as well as representative of the Markets Committee of the Corporation of Manchester.

WOOD PULP FOR FIREPROOFING MATERIAL

The construction of mills, factories and offices and other buildings so as to make them absolutely fireproof is one of the great problems with which architects and builders of the present day have to deal. Great advances along this line have been made in recent years, but the problem has not yet been solved on account of the large extent to which ordinary wood is used in the interior of buildings.

There was recently invented a material which will do much to prevent the spread of fires, and hence go a long way toward solving the problem of making buildings proof against the ravages of what has been aptly described as "a good friend, but a bad master." This discovery relates to flooring, and it is interesting to note that one of its chief ingredients is wood pulp, for which science has found a great many more uses than in the manufacture of paper. Several of these compositions are on the German market, and are said to have proved successful and advantageous. One of them is "doloment," or stone wood.

Doloment is a plastic substance about the consistency of mortar, made of pulverized wood fibre, asbestos, and a mineral substance, and colored by the admixture of various oxides to any desirable color or tint, viz., terra cotta, gray, cream-white, and grained in imitation of red or blue-veined marble.

It is laid down in a smooth, even layer, half an inch thick, upon the beton or cement substructure, which in German construction rests upon steel joists and forms the foundation of all floors, whether of wood, marble, or other materials. The problem has been to make a continuous flooring, which shall cover the entire area of an ordinary room, fit closely at its junctions with upright walls, and be not only fireproof, but impervious to liquids, dust, vermin of all kinds, a poor conductor of heat and sound, easily cleaned, and withal neat and sightly in appearance. All these requirements appear to have been successfully reached by this material.

In practice it was found that the doloment and other similar plastic floorings adhere very firmly to the beton foundation, so that when the latter was subject to any severe strain or fracture, through extreme changes of temperature or the uneven settling of the building, the flooring was liable to crack under the tension thus created. To obviate this the plan has been adopted of laying between the beton substructure and the fireproof flooring an insulating layer of a composition composed of fine cork chips, asbestos, sawdust, and some cohesive matrix to hold the other ingredients together. This intermediate layer of comparatively light elastic substance separates the wood-stone flooring from the rigid cement foundation, makes it warmer and less resonant, absorbs whatever moisture may enter by absorption from the outer walls, and—what is most important—enables the floor to be laid completely jointless and impermeable over a large surface, and joined tightly at the edges to the circumscribing walls.

The composition of the cork-asbestos layer is such that it remains to some degree elastic after it has become firm, and it, therefore, readily takes up and neutralizes the effect of any cracks that may occur in the cement base without affecting the surface of the stone-wood floor.

Doloment is used for the flooring of vast departments where smoothness, cleanliness, and imperviousness to water, chemicals, fire and decay are indispensable requisites. When finished, doloment has a surface like that of polished marble.

This material might be used also as a substitute for wood used in other parts of buildings, such as doors, or at least, door frames and window frames, protected, if necessary, by means of a metal skeleton or a sort of wire netting, such as is sometimes used to support or strengthen colored or ground glass windows.

NEW PULP MILL IN TEMISKAMING.

The Ontario Government has accepted the tender of a syndicate represented by C. Millar, 55 Yonge Street, Toronto, for the lease of the North Temiskaming pulpwood limit. The syndicate offered a bonus of $40,000. The limit is in the Nipissing district, north of Lake Temiskaming, and contains nine hundred square miles of land. In addition to the bonus the successful tenderers pay dues of 40 cents a cord for spruce and 20 cents a cord for other pulpwood cut. The wood to be cut is confined to poplar or whitewood and banksian or jackpine, eight inches and upwards in diameter. The tenderers must build within the limit or at some other place approved by the Government, a pulp or pulp and paper mill costing with equipment not less than $250,000 to operate the same, so that the daily output shall not be less than 30 tons, and at least 75 hands shall be kept employed for ten months in every year.

The lease runs for twenty-one years, the title to the land remaining with the Crown. The wood cut must not be exported or sold to any person. It must supply the mills erected.

Failure to erect the mill or make the expenditure within the time limit forfeits the lease.

NEW BRUNSWICK FORESTRY ASSOCIATION.

The New Brunswick Forestry Association held a Convention in Fredericton. which was really a meeting of organization, on the 20th and 21st ult. There was a very good attendance.

Premier Tweedie, who was in the chair, stated the Government's intention to act on what it had learned, and to make changes in the law relating to the timber lands of New Brunswick.

Elihu Stewart, of Ottawa, president of the Canadian Forestry Association, read a paper on "The General Need of Forestry Preservation," dealing with the subject in a practical way.

Attorney-General Pugsley, pointed out the difficulties that might be encountered in bringing the owners of private lands into line.

Dr. Bailey read an interesting paper on "The Pulp Industry of Canada," from the pen of Prof. Penhollow, of McGill University, illustrated by lantern slides.

Hon. Mr. Emmerson, Minister of Railways and Canals, followed, speaking of the connection of forestry with transportation and of the gradual decadence of the timber supply.

In reply to a question whether land burnt over would produce spruce, Mr. Beveridge stated that Norway spruce had been planted and was growing on burnt land at St. Margaret's Bay, N. S.

A committee which had been appointed to consider the question of forming a permanent forestry association in New Brunswick recommended that one be formed in affiliation with the Canadian Forestry Association.

A resolution was carried requesting the Provincial Government to prohibit the exportation of pulp-wood.

* * *

—A new company chartered in Quebec is La Compagnie de Publication de Levis, with a capital stock of $20,000, headquarters at Levis, to carry on printing, binding, book selling and newspaper publishing. The charter members are: Auguste Carrier, trader; Cléophas Blouin, manufacturer; Etienne Dussault, Sr., and Thomas Powers, contractors; Alfred Blouin, Merchant; Felix Pichette, printer; S. Cleophas Auger, pilot; Alfred Roy, physician; Etienne Dussault, Jr., student; Horace Dussault, contractor; Almanzer Lamontagne, merchant, and Anselme Romauld Roy, photographer, all of Levis.

TRADE CUSTOMS.

At the recent meeting of the American Paper and Pulp Association trade customs were discussed, and became an important feature. The discussion started on a resolution that the official chemist of the Association should make a comparative study of the various means of sampling and testing wood pulp and fibre with a view to the recommendation of an official method.

This is a question of great importance. A manufacturer cannot afford to pay pulp prices for water, nor can the manufacturer of pulp afford to give more than 16 ounces of pulp to the pound.

The Association adopted the trade customs already adopted by the Book division. With one or two alterations also, these trade customs were adopted by the Writing Paper Manufacturers as follows:—

1. On special sizes, not less than 10 per cent. additional price for lots of less than one ton.

2. On special colors or colors not regularly made in the grade ordered ton lots or less, not less than 10 per cent. additional price. One to two tons not less than 5 per cent. additional.

3. On special orders of one ton or less over runs, not greater than 15 per cent. to be taken by customers; on orders for more than one ton over runs, not greater than 10 per cent. to be taken by customers.

4. Orders for less than a full package. 10 per cent. additional.

5. No paper made one weight and stenciled another.

6. The average actual weight, including wrappers, not to exceed 2½ per cent. above or below the nominal weight. Paper within this range to constitute a good delivery, and to be billed at nominal weight. The above to be based on items of one size and weight on individual invoices.

7. No claims allowed after paper is cut, ruled or printed.

8. No paper of private water-marks or brands to be supplied for sampling purposes nor allowance made on account of advertising such water-marks or brands.

9. All goods to be billed when ready or at accepted date for shipment, and to be settled at the usual time, whether ordered shipped or not.

10. A charge of not less than one and one-half cents per pound for folding in ream bundles, and not less than two cents per pound for quarter reams and pound packages. A charge of not less than one-half cent per pound to be made for faint line ruling, such as letter-heads. etc., and not less than one cent per pound for struck ruling, such as bill-heads, statements, etc.

11. Jobbers or manufacturers desiring special water-marks for their customers must pay the cost of the dandy roll and no credit will be given on account of the number of cases ordered.

❧

TO REFOREST SPRUCE.

The following letter in the Toronto "News," signed "Timber Valuator," shows the seriousness of the situation, so far as the future is concerned:

"In view of the growing scarcity of forest products many substitutes have been offered and suggested to take the place of wood for building material, yet, notwithstanding the near approach to a timber and lumber famine, and the high prices now being paid for lumber, it is still the cheapest, safest and best building material. Brick, cement and steel have been experimented with to a considerable extent, but nothing has yet been discovered or invented that will serve to check the increasing demand for lumber as a building material. When I was a boy rags were used almost exclusively for making all kinds of paper. but to-day I have it from good authority that 85 per cent. of all the paper manufactured is made from wood pulp, chiefly spruce. I was recently given a list of ten newspapers the daily issue of each of which required the product of a well-timbered acre of spruce. To one that knows approximately the total amount of raw material available, it does not require much of a mathematician to figure out how long it will require to exhaust the supply at the present rate of consumption. Pulp mills on the west side of Lake Michigan have been getting their supply of spruce from Ontario for several years. Going east through Ontario and nearing the Ottawa River we gradually run out of the pine belt and find the spruce timber predominating through the Provinces of Quebec, New Brunswick, Nova Scotia and the State of Maine. But, like the Western States of Michigan, Wisconsin and Minnesota, they have become almost entirely denuded of spruce, even that suitable for pulp-wood, with the exception of the Province of Quebec, which is now producing more pulp-wood, pulp and paper than any other Province or State. Within the past two years there have been established 17 pulp mills and rossing plants north of St. Lawrence River, the products of which are shipped to New York and other Eastern markets. I would suggest that the Forestry Associations give some attention to the reforestry of spruce pulp-wood as well as to the reforestation of pine, or some day we may be short of "news" paper.

⁂

THE TARIFF IN COMMITTEE.

The new tariff has been the subject of considerable argument over details in committee. The changes affecting the paper trade are not of very great importance. They are as follows:

Item 192, giving the duties on strawboard, millboard and cardboard, inserts after the latter word "not pasted or coated."

Item 201, providing for the free importation of matrix paper, adapted for use in printing, inserts after the word "paper" the words "not being tissue paper."

Item 237, which gives the duties on celluloid made in different shapes, as well as celluloid blanks, has added to it the words "and comb blanks." All are dutiable at 5, 7½ and 10 per cent.

Item 441—After "typesetting machines" insert words "and parts thereof."

Item 442 has been made to read: Printing presses, lithographic presses and type making accessories therefor, also machines specially designed for ruling, folding, binding, embossing, creasing or cutting paper or cardboard, when for use exclusively by printers, bookbinders and by manufacturers of articles made from paper or cardboard, including parts thereof, composed wholly or in part of iron, steel, brass or wood, preferential 5 per cent., intermediate and general 10 per cent. each.

⁂

THE HARMSWORTH ENTERPRISE

The following is a description by a St. John's man of the work being carried on at Grand Falls, Newfoundland, by the Harmsworths:

At Grand Falls, the seat of the, big pulp-making enterprise projected by the Harmsworths, of London, on the strength of the concession of 2,000 square miles of our lands which they obtained two years ago, they are formulating plans for the launching of the venture on a scale as spacious as originally outlined. They have chosen and surveyed a town site; plotted off streets, squares and areas for churches, schools, and public buildings; built a $10,000 log cabin for the manager's residence; erected houses for the staff and employees; built two miles of railway from the Reid Co.'s line, and landed 3,000 barrels of cement with which to begin next spring the construction of the drain whereby a stream of water will be diverted into flume to provide the power to operate the mills which will be worked there. The present winter they have

160 men cutting logs in the forest to be used in the building of the dam and these are being cut into the required lengths and shapes in a mill built at the site for the purpose, and where all the lumber for the various buildings is also being got out. An eminent American expert in the designing of pulp mills is preparing the plans for the whole installation, with a view to adopting them to the physical features of the region and it is expected that some 800 or 900 men will be employed there next season in the construction of the dam and buildings. Meanwhile the surveying of the boundaries of the area embraced in their concession is proceeding apace as it has to be completed within the next three years, and it is expected that within that period the practical working of the project will be in full swing and the daily output of pulp and paper such as to give visible demonstration to the world at large that this colony is a factor to be reckoned with.

*

A FINE PAPER MACHINE.

The Union Machine Company, Fitchburg, Mass., has just shipped to the Roanoke Rapids Paper Mfg. Company, Roanoke Rapids, N. C., one of their large, modern, high speed, "Union" Fourdrinier paper machines from their latest up-to-date patterns, consisting of the Fourdrinier with flow-box, shake arrangements, couch parts, 3 presses, and drier part. The Fourdrinier part has 47 table rolls with wire 102 in. wide, 60 ft. long. The couch part consists of top gun metal couch roll 20 in. diameter, 106 in. face; bottom gun metal couch roll 18 in. diameter, 104 in. face, with frame work and bell-crank arrangement for raising and lowering top couch roll. Each press consists of one top gun metal press roll 18 in. diameter, 103 in. face, and one bottom rubber-covered press roll 20 in. diameter, 102 in. face, with frame work and housings arranged for raising and lowering the top roll. The drier part consists of 32 driers 40 in. diameter by 100 in. face, and one receiving drier 24 in. diameter by 100 in. face, with all frame work and housings complete. The entire length of this machine is 250 feet over all, and weighs in the vicinity of 150 tons, and twelve large machinery cars were required to transport it from Fitchburg to its destination.

*

THE "UNION" JORDAN ENGINE.

—The Union Machine Co., Fitchburg, Mass., call our attention to the new style "Union" Jordan Engine. It is made in two sizes, the "Union Improved" and the "Union Mogul," with normal capacities of 1,500 to 2,000 pounds, and 3,000 to 3,500 pounds per hour respectively. They are of first-class construction throughout, and have many up-to-date improvements which are money-savers. The method of attaching shell. heads, stands and base together by using slotted lugs into which bolts slide easily, does away with cap screws that often rust in and break off when attempt is made to remove them. At one mill where they are using a number of these small Jordans, the superintendent told the Union Machine Company's representative he could take apart one of these Jordans for chipping in twenty minutes. whereas the old style, with cap screws in head, took his men a number of hours. The water-cooled, ring-oiling boxes with genuine babbitt removable linings, will be appreciated by the millwright, as the form of construction does away with old methods of lining up and babitting boxes to shaft. The new style linings, when worn out, can be removed (when Jordan is apart for chipping) and new ones substituted very quickly and easily. In fact, it has been proved that this engine can be taken apart, chipped. babbitted and put together again in less than half the time required for any other Jordan, making a great saving of time and trouble, which means dollars. The heads and box supports are cast in one piece, thereby insuring great strength and at the same time avoiding any possibility of box supports getting out of line with heads. There is a large sand box or "catch-all" located where it will prevent all foreign matter from entering the Jordan and breaking down the knives. The shafts through the plug are of hammered steel, the small Jordan being 5⅜-inch disc, and the large Jordan being 6⅜-inch disc. They are covered with cast bronze sleeves and not with the soft brass tubing which is generally used, thereby insuring a longer and better service. The "Union Improved" Jordan runs at a speed of about 350 revolutions per minute, and requires a floor space of 12 feet by 41 inches over all, and weighs about 8,000 pounds. The "Union Mogul" Jordan engine runs at an average speed of 450 revolutions per minute, and requires a floor space of 18 feet by 45 inches over all, and weighs about 20,000 pounds. There are a large number of these Jordans running in the United States, and there are also some in Canada, and the Union Machine Company state that they have had nothing but favorable reports wherever they have been placed, and that in many cases they have had duplicate orders from the same concern.

* * *

—The Grand Trunk Railway Company have decided to erect a fine building in connection with the Jamestown Exhibition, which opens at Norfolk, Virginia, on April 26th, It will afford a colonial effect, with a wide verandah surrounding front half of the structure. It will be situated on a plot 50 x 100 feet in one of the best locations on the grounds, within a stone's throw of the Manufacturers and Liberal Arts Building and a short distance from the "War Path"—that portion of the grounds set apart for the lighter attractions, and which will be on similar lines to the "Midway" of the Chicago World's Fair and "The Pike" at the St. Louis World's Fair. The interior will be of Elizabethan design, and finished in dark colors, a series of large photographic views being inserted in the panels that will form the inner sheathing of the walls. A decorative frieze in colors and executed in oils will adorn the upper portion of the walls, and will consist of subjects symbolical of Canadian manufactures, industries, summer vacation haunts, transportation, hunting in Canada, etc. The exhibit will be one of the best advertisements that Canada has ever had in the United States.

* * *

—The "Ottawa Citizen" points to the large sums made by persons who have bought timber limits for small sums, and adds: "Here is an opportunity for the Government to go into municipal ownership of timber limits and make money for the people. The Government should adopt the principle of retaining the timber limits as a public possession and selling the products as raw material to the manufacturers. The Government could let contracts for cutting a certain amount of timber each year and sell it to the manufacturers. This would prevent the denuding and almost destruction of limits which is the case under the present system. only trees of certain size would be cut, and the smaller ones would be allowed to grow until sufficiently large to make good timber."

* * *

—George Christie, Limited, are manufacturers of Fourdrinier machine wires and cylinder covers, of all meshes. Have made a specialty for some time of Fourdrinier wires of special Ruby metal, the results being of the most satisfactory kind. By means of a patent attachment to their looms they are able to produce cloths very much above the average strength, and at the same time very smooth and uniform in surface, thereby increasing the life of the wires on the machines, and minimizing the wire mark on the under side of the sheet. The factory is fitted with the most up-to-date looms and finishing plant, and as the wire used is drawn by themselves, and specially selected for the manufacture of Fourdrinier machine wires, they are able to turn out a class of work second to none. Their business has shown a steady growth, and in fifteen years it has quite quadrupled itself. Their agent for Canada is Thomas L. Paton, 30 St. Francois Xavier Street, Montreal, and he holds stock of Fourdrinier wires and other cloths for immediate delivery. Any orders or enquiries sent to that gentleman will have immediate attention.

EMERSON MFG. CO.

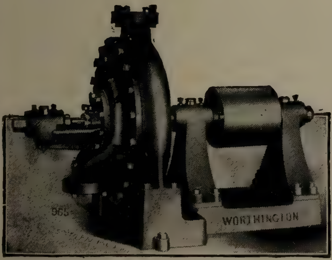
Jordan
Press Rolls
Plates
Wet Machines
Engines
Cylinder Machines
Cylinder Washers
Engine
Bars
Avenues of Our Success.
EMERSON
All Work Guaranteed.
Fourdrinier Machines
Stuff Chests
Beating
Centrifugal Pumps
Stuff Pumps
Bed
Filling for all styles of Jordans
Engines

LAWRENCE, = = = MASS. F

The John McDougall Caledonian Iron Works Co.

LIMITED

MONTREAL, P.Q.



Worthington Turbine Fire Pump, working pressure 160 lbs.

BOILERS:

Return Tubular "McDougall"
Water Tube, etc.

TANKS:

Water Tanks, Penstocks, Steel Riveted Pipe.

Hydraulic Presses:

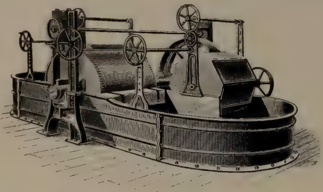
For Pulp and Paper Mills.

Builders in Canada for "WORTHINGTON" TURBINE PUMPS, CONDENSERS, Etc. and New York Filter Co's. Pressure Filters.

HOLYOKE MACHINE COMPANY

HOLYOKE, MASS., U.S.A.

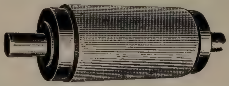
MANUFACTURERS OF



Washing and Beating Engines with Patent Double Hoist and Tubs of either wood or iron.

Hydraulic Pumps and Presses.

Rag Cutters and Rag Dusters.



Cotton and Paper Rolls with Patent Fastenings.

Patent Improved Wood Pulp Grinder.

Elevators, Rotary Fire Pumps and Friction Gearing.

Gears Accurately Spaced and Planed.

Shafting, Pulleys and Mill Work.

Machinery for Wood Pulp and Paper Mills.

Vertical and Horizontal Water Wheels with Flumes and all connections.

Wood Barkers, Wood Chippers and Wet Machines.

Newest Designs

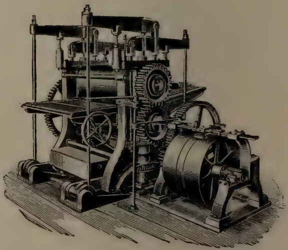
AND

Highest Efficiency

Calenders. All kinds of Super-Calenders, Friction Calenders and Platers.

Chilled Iron Rolls.

Special Machinery.

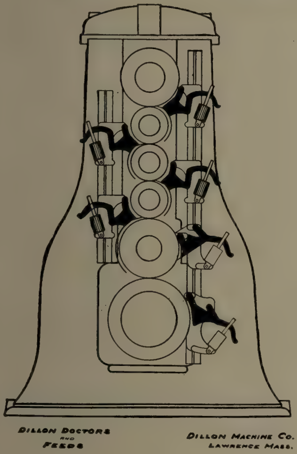


Description and Estimates Furnished; also Gear List and Catalogs sent on application.

DILLON MACHINE CO.

BUILDERS OF

PAPER MILL MACHINERY



- Beating Engines
- Washing Engines
- Jordan's Three Sizes—Single, Double & Triple
- Stuff Pumps, with Dillon Patent Valve Seating
- Wet Machines
- Horizontal and Vertical Stuff Chests
- Single and Double Paper Cutters
- Backstands
- Plates, Knives and Bars

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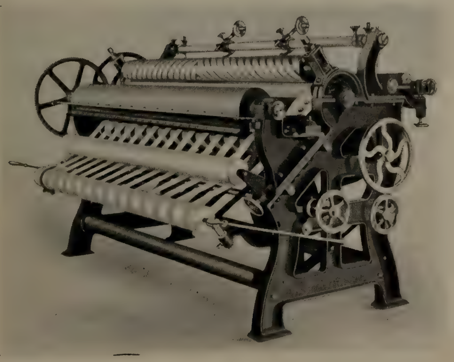
DOCTORS
AND FEEDS
MADE IN
CANADA
BY THE
SHERBROOKE
IRON WORKS,
SHERBROOKE, P.Q.



LAWRENCE, MASS., U.S.A

THE MARKETS.

Toronto, March 18th, 1907.

Pulp is very firm in all sections. Groundwood is very hard to obtain at any price. What is coming forward now is on contract at $22 to $26 per ton delivered. Sulphite pulp has advanced about $3 to $5 per ton. We hear of cases where buyers offered $47 per ton, but this was refused and $2.50 per cwt. demanded.

Paper is in a stronger and better position than for some time. First-class news is $4 per ton higher. Writings have been advanced owing to the higher price of raw materials and the increasing manufacturing costs. Wrappings are firmer with a tendency to get outside quotations. The average higher range of values would perhaps reach $3 per ton.

BRITISH MARKETS.

In Great Britain the mechanical wood pulp market is decidedly firmer. Moist is offered at £2 4s. 6d., dry at £4 15s. There is a steady demand for sulphite. Prices for this year's deliveries are well maintained. Soda pulp is also firm.

The chemical market is also steady.

TRADE ENQUIRIES.

The following enquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these enquiries, with their addresses, can be obtained upon application to Supt. of Commercial Agencies. the Department of Trade and Commerce, Ottawa.

141. **Elastic Pulp Plaster.**—A firm in New Zealand desires to communicate with manufacturers in Canada of reliable brands of elastic pulp plaster, not already represented in that colony; correspondents to state cost per ton c.i.f. Auckland and terms of agency for colony.

167. **Paper, Chemical Pulp.**—A commercial firm in Japan, with houses in China and Korea, are desirous of receiving offers from Canadian exporters in the following lines: Paper, chemical pulp.

174. **Sulphide Wood Pulp Board.**—A London firm who could dispose of large quantities of sulphide wood pulp board wishes to get into touch with Canadian manufacturers who can fill orders.

248. **Agent.**—A London manufacturer of pastes and other stationery specialties is open to appoint suitable Canadian resident agent.

THE PRESS TRIP TO NIAGARA.

The trip of the Canadian Paper Association to Niagara Falls on February 9th, was undertaken under the happiest auspices. The party was given the courtesy of three special cars by the Grand Trunk Railway, and, under the personal and kindly superintendence of J. D. McDonald, district passenger agent, and Mr. Duperow, assistant passenger agent, were made to feel thoroughly at home. At the Falls the pressmen were taken in hand by the Ontario Power Company, and had an opportunity of inspecting the marvellous works of that enterprising company. They also were charmed with the more than up-to-date factory of the Natural Food Company, and with the arrangements made by that company for the welfare and comfort of its employees. Last, but not least, must be mentioned the hospitality of the Clifton House. the new hotel with the marvellous view of the Falls. The tasty luncheon provided at that high-class house was one that will long be remembered with pleasure by the 150 visitors.

Position Wanted

Superintendent open for Engagement.

1st of March. A1 on Book, Bond, Blottings and Coating Stock. 17 year's experience in different parts of the Globe. Used to the working of daily cost sheets. Would not object to handling a mill making a lower grade with a view to working it up to Book and Blottings. Highest reference as to ability, character, etc.

Address M. R. J.,
care Pulp and Paper Magazine, Toronto.

THE Swenson EVAPORATOR

Boils off Water, not Spent Caustic.
Is easily kept clean.
Seldom repaired, and then with ease.
Works most Rapidly and Efficiently.

American Foundry & Machinery Co.

(Formerly WALBURN-SWENSON CO.)

Works: CHICAGO HEIGHTS. 944 Monadnock, CHICAGO

Pulp and Paper Handbook of Canada

This Directory will give full information regarding the pulp and paper mills of Canada, the officers, managers, superintendents, capacity, power used, particulars of machinery, kind of power used, products of each mill, and selling agents, if any. Also all the available information to the time of going to press of new mills projected; paper box factories, paper bag manufacturers, wholesale paper dealers, jobbers, bookbinders, etc.

THE REVISED CANADIAN TARIFF as it affects the pulpwood, pulp and paper industries, pulp and paper machinery and mill supplies will also be given; also the tariffs of the U.S. and Newfoundland.

BOUND IN CLOTH. Type size of page, 4¾ x 7 inches

Advertising rates:

One page.........$25 (£5)	One third page...$10 (£2)
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Subscription price to non-advertisers, $2 to United States and Canada; 8/- to Great Britain, or British Colonies; foreign, 9/-. All books post paid.

BIGGAR-WILSON Limited, Publishers,
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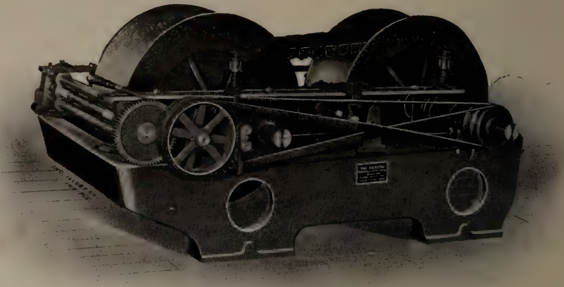


The Much Talked of

"THE REEVES"

Variable Speed Transmission

The one practical device for regulating the speed of the paper machine.

It everlastingly gets away from the nerve racking old true cone, in whatever form it seeks to disguise itself.

There is absolutely no shifting of belt.

It is made in sizes to drive anything from a winder to a 140″ Fourdrinier.

Any speed within its extreme range of variation may be instantly secured and the changes effected without breaking or stopping the paper sheet.

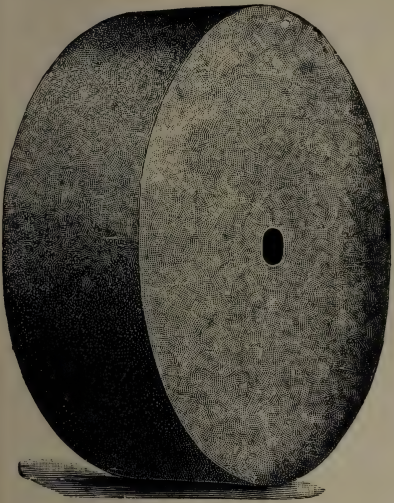
Recommended and adopted by the largest and most progressive paper mills in America and Europe.

Send for Paper Machinery Catalogue To-day

REEVES PULLEY COMPANY,

COLUMBUS, INDIANA, U.S.A.

German Grindstones



Wood Grindstones,

Wood Pulp Refiner Stones,

Edge-Runners

French Millstones

Artificial Emery and Quarzstones

Stones of all kinds used in Wood Pulp and Paper Manufactories.

Six Own Quarries at
Wehlen-Zeichen and Langenhennersdorf (Saxony)

Neuland and Goldbach (Silesia) Hoffnung (Bohemia).

GEBRÜDER ISRAEL
PIRNA-ON-THE-ELBE (SAXONY)

Oldest Factory for Wood Grindstones in Germany. Established 1866.

THE MOREAU PULPWOOD and LOG BARKER

Built expressly to peel pulpwood.

Capacity, 3 Cords per hour with 2 men and 6 horse power.

It will save the bark which can be used for other purposes.

Peels wood of all dimensions, 3 inches up and of all lengths from 36 inches up.

The most desirable certificates and full particulars on application to

The Moreau Barking Machine Co., Ltd.

C. MANSEAU, Selling Agent for U.S. and Canada, Mitchell, Quebec.

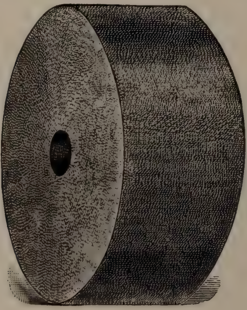
RELIABLE AGENTS WANTED.

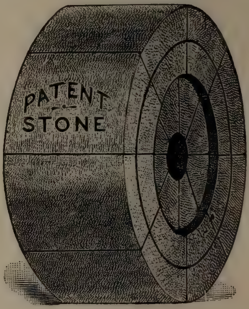
PULP STONES

ENGLISH, GERMAN and SCANDINAVIAN

ALSO THE

PATENT UNIVERSAL





the construction of which gives to it advantages not found in the one piece stone.

Let us tell you about them

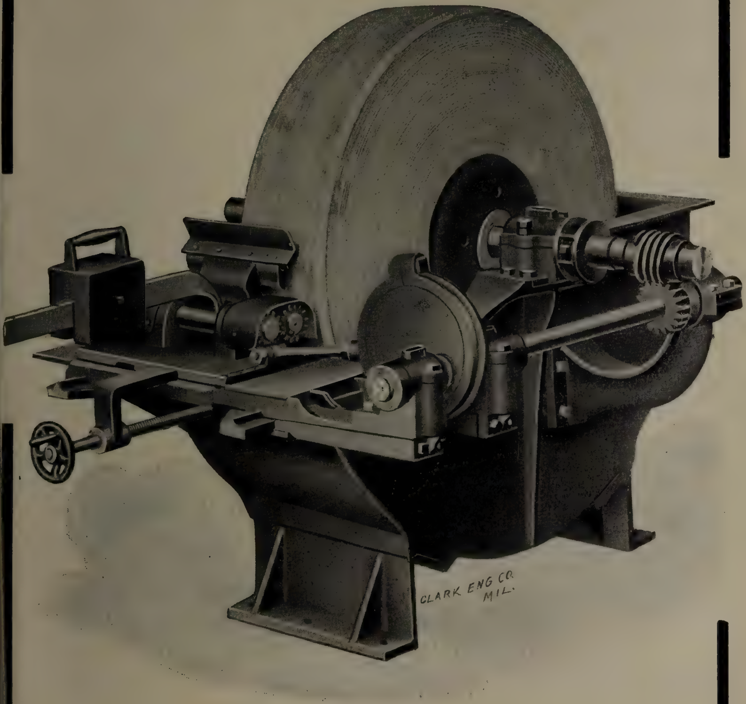
JEAN FREESE

132 NASSAU ST., NEW YORK, U.S.A

At the instigation of Senator Davis, the Dominion Government has appointed a select committee to prepare for an exploration of the country north of the Saskatchewan River, betwee the Rock Mountains and Hudso Bay, with special reference to its fo est and other resources.

Valley Iron Works Co.,

Paper & Pulp Mill Machinery Specialists



AUTOMATIC BARKER KNIFE GRINDER.

This machine has a capacity of 150 perfectly ground knives per day, and does not draw the temper of the knife—therefore effects a saving in your knife account. It is the only machine of its kind on the market.

WRITE US FOR PRICES.

Valley Iron Works Co., Appleton, Wis.,

U. S. A.

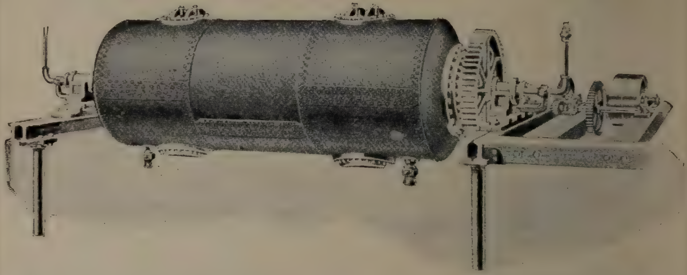
Holyoke Steam Boiler Works,

INCORPORATED **HOLYOKE, MASS., U.S.A.** T. H. SEARS, Mgr.

MANUFACTURERS OF

EXTENSION FURNACES, HIGH PRESSURE HORIZONTAL TUBULAR BOILERS, IMPROVED DIGESTER, IMPROVED VERTICAL BOILERS.

Improved Rotary Bleach Boilers.



This cut illustrates our improved rotary bleach boiler the result of more than 30 years careful study and experience. The most complete of its kind in the world. Over 500 in use in Canada, United States and Mexico

We are specialists in boilers and furnaces for pulp and paper mills. Let us know your requirements.

T. J. MARSHALL & CO.

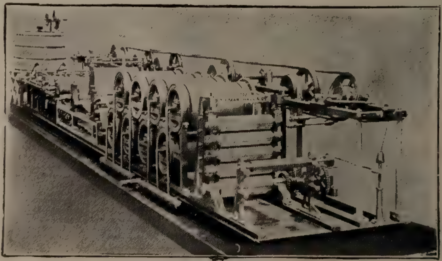
The OLDEST & LARGEST MANUFACTURERS of **DANDY ROLLS** IN THE WORLD.

BANK NOTE MOULDS, DECKLE STRAPS, CUTTING MACHINES, ANIMAL SIZING MACHINES, PATENT DANDY ROLL CARRIAGES, PAPER TESTING MACHINES, PAPER SCALES, &c.

Established 1792.

By Special Appointment to H.M. Stationery Office

Telegraphic Address: "Dandyrolls, London."



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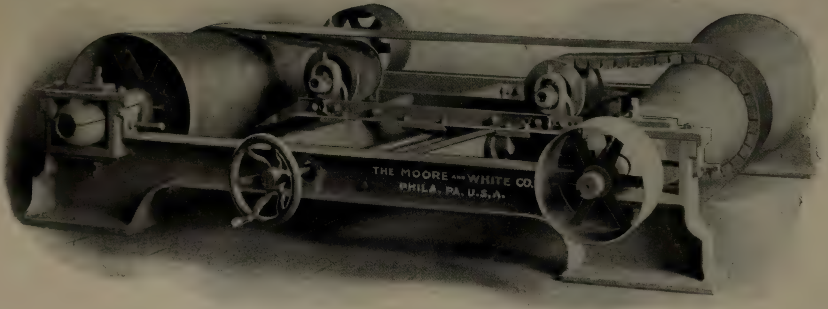
By Special Appointment to H.M India Office

Manufacturers of the Smallest Paper-making Machine in the World

Specially constructed for Mill Testings before Making the bulk, the same results being obtained as from a wide Fourdrinier Machine. Also for Technical Instruction.

T. J. MARSHALL & CO., CAMPBELL WORKS. Stoke Newington, LONDON, N.

“Moore & White” SPEED CHANGE for Paper Machines.



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ANY DESIRED RATIO OF CHANGE.

Absolutely No End Thrust or Tendency Sidewise of Transformers or Driving Belt.

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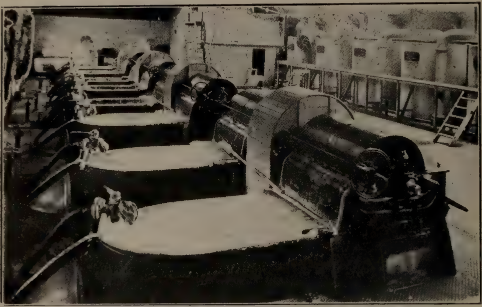
BUILDERS OF PAPER MAKING
MACHINERY

Masson, Scott & Co., Limited

Paper-Makers' Engineers



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Patent Machinery for Bleaching and Beating.

Strainer Plates. Closing Strainer Plates.

Sole British Agents for

Robert Dietrich's Kneader for Pulping Paper Stock.

MASSON, SCOTT & CO., LIMITED
CORONATION WHARF, FULHAM,
LONDON, S.W., = = ENGLAND.

500 Twelve-Foot Logs per Hour

Cut into two-foot lengths ready for the barker. That is the ordinary capacity of

Perron, Gagnon & Co.'s Automatic Pulp Wood Sawing Machine.

(Patented in United States and Canada, 1900 and 1906.)

One man alone operating the machine can cut 5,000 logs every ten hours without much exertion. Logs automatically conveyed to the saws, and from the saws to the barker. A machine installed in the large No. 2 mill of the Chicoutimi Pulp Co. and operating 10 hours per day

Supplies Wood to Twenty Grinders Working 24 Consecutive Hours.

On account of its many advantages, and the fact that it requires only one man to operate, our machine has replaced expensive systems requiring the services of 18 to 20 men.

ECONOMISE IN YOUR WAGES BILLS, INCREASE YOUR PRODUCTION, AND SWELL YOUR PROFITS.

This can only be done in the pulp mill by the use of our up-to-date sawing system. Write to-day for catalogue and particulars.

PERRON, GAGNON & CO.,
Chicoutimi, Quebec,
Patentees and Sole Manufacturers.

A. WERTHEIM & Co.

HAMBURG.

IMPORT AND EXPORT ALL KINDS OF

Sulphite,
Soda and
Mechanical

WOOD PULPS

OFFICES AT:

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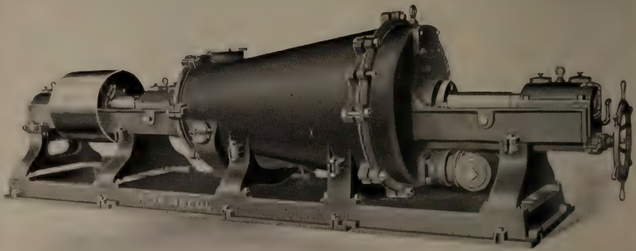
Telegraphic Address:

"WERTHEIMO, HAMBURG."

"The Best Jordan In Canada"

Above Statement from Dominion Paper Co.,
Kingsey Falls, P.Q.



The "Union" Jordan Engine

Has many new and original ideas ;

NOTE our method of attaching Shell, Heads, Stands and Base together. By using slotted Lugs into which bolts slide easily ; it does away with cap screws that often rust in and break off when attempt is made to remove them.

NOTE our Water-cooled, Ring-oiling, Boxes with Genuine Babbitt Removable Linings. Our special Linings will be appreciated by the mill-wright, as they do away with old methods of lining up and babbitting box to shaft. Our linings when worn out can be removed (say when Jordan is apart for chipping) and new ones substituted very quickly and easily.

NOTE that owing to these features our Engine can be taken apart, chipped, babbitted and put together again in less than half the time required for any other Jordan, making a great saving of time and trouble, and this means Dollars.

NOTE that our Heads and Box Supports are cast in one piece, thereby insuring greater strength and at same time avoiding any possibility of Box Supports getting out of line with Heads.

NOTE that we have an especially large Sand Box or "Catch-all" and have located it where it will prevent all foreign matter from entering Jordan and breaking down knives.

NOTE that we put cast Bronze Sleeves on shaft instead of brass tubing, thereby giving a very much harder wearing surface and long life Sleeve.

"THESE SIX 'POINTERS' WE WOULD LIKE TO HAVE YOU COMPARE WITH ANY OTHER JORDAN MADE "

Our Jordans are made in two sizes, the "Union Improved" and the "Union Mogul," with normal capacities of 2000 and 3500 lbs. per hour respectively.

They cost no more than any first-class Jordan Engine and our improvements will save many Dollars a year. Built only by the

UNION MACHINE CO.,

FITCHBURG, MASS., U. S. A.

MIRAMICHI PULP & PAPER CO., Limited

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Manufacturers of High Grade Easy Bleaching

Sulphite
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Suitable for Writing and Book Papers

St. John Pulp and Paper Company,

MISPEC, N. B.

Highest grade Sulphite for Book, Ledger and Writings,
Quality equal to best imported Norwegian Stock.

Address all communications to the Managers,

STETSON CUTLER & Co.
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Mechanical and
Chemical Pulp
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Sole Agent for U.S.A. and Canada of

A. G. fur Maschinenpapierfabrikation, Aschaffenburg.

Finest Bleached and Unbleached Sulphite Pulps.

THE PUSEY & JONES COMPANY

WILMINGTON, DELAWARE, U.S.A.

Machinery for Paper Mills and Pulp Mills

REPRESENTED BY

THE WM. HAMILTON MFG. CO., LTD.,

PETERBOROUGH, ONTARIO,

Who are prepared to Build in Canada the Inventions
Patented in Canada by THOMAS H. SAVERY,
Under Numbers 68,093, 71,746, 72,118, 77,818, 89,114, 89,115;
J. H. GATELY'S Guard-Board, Canadian Patent 74,735,
Ejector Vacuum Pumps — Bertrams Limited — Patent.
Wahlstrom's Patent Refiner—Canadian Patent 89,368.

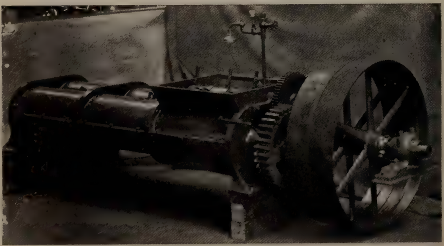
DR. C. WURSTER'S Patented
Pulping Engines and Kneaders

For PULPING UP MACHINE "BROKE," OLD PAPER STOCK, WASTE PAPERS, DRY WOOD PULP, &c.

These Machines, with the same power, do from TWO to FOUR TIMES the WORK of STONES, without Shortening, Affecting, Creasing, or Wetting the Fibre in any way, or Changing the Colour or the Sizing.

Beaters not required in making Boards from Old Paper Stock.

Can be used for Kneading Clay and other fillers, as well as for Kneading Dry Bleaching Powders, instead of the Bleaching Mill.



Three Segment Pulping Engine—Trough 800 and 2,000 lbs.

OVER 300 SOLD

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FOR PARTICULARS APPLY TO

BERTRAMS LIMITED, St. Katherines Works, The Sciennes, EDINBURGH,
SCOTLAND, (Sole Makers for Great Briiain and Colonies).

POSITION WANTED.

A mill manager, having experience in the manufacture of Kraft Brown both in Sweden and England, is open for an engagement with a Canadian mill. Is able to take charge of a paper mill as manager or assistant manager. Address "Kraft," c/o Pulp and Paper Magazine.

FOR SALE

Cylinder Paper Machine, 72 inches wide, complete from screen to winder, including steam engine, all shafting and pulleys. Reason for selling, replacing by a larger machine. Will sell cheap to prompt buyer. Apply to "Paper Manufacturer," care Pulp and Paper Magazine, Toronto, Canada.

PAPER STOCK MARKET REPORT.

Montreal, March 18, 1907.

A good demand continues for all kinds of paper stock.

Cotton rags are going largely to New England mills. Canadian mills appear to have sufficient on hand, or are using other material.

There is a good inquiry for Manilla rope, the price of which is slowly advancing. Collections at this time of the year are small. Bagging is in fair demand, but the price keeps about the same, no material advance since last autumn.

Roofing stock is still scarce, and is being closely bought up. This scarcity is likely to last for some time.

Waste paper of all kinds, and especially the best qualities, are selling well. A good deal of common waste is going south to American mills.

Quotations are as follows:—

No. 1 white shirt cuttings	$5.00	to	$5.50
Light print cuttings	4.00	to	4.50
Unbleached cuttings	4.50	to	5.00
White shoe clips	4.50	to	5.00
Colored shoe clips	3.25	to	3.75
Domestic white rags	2.25	to	2.50
Blues and thirds	1.25	to	1.50
Roofing stock	.90	to	1.20
Manilla rope	3.75	to	
Waste papers	.35	to	.40
Bagging	.90	to	1.10

ARTHUR P. TIPPET & CO.

Agents and Importers

PAPER MILL SUPPLIES

SULPHUR

Sal Ammoniac, Borax, Alum, Satinite, etc.

MONTREAL - TORONTO

THE UNITED WIRE WORKS LTD,

EDINBURGH, GLASGOW & NEWCASTLE-ON-TYNE

FOURDRINIER WIRES, CYLINDER WIRES,

AND WIRE CLOTH OF ALL KINDS.

AGENTS. ARTHUR P. TIPPET & CO 8 PLACE ROYALE MONTREAL.

WIRES HELD IN STOCK AT MONTREAL FOR PROMPT DELIVERY.

Cable Address,—"Kaolin, Manchester." A.B.C. Codes, 4th & 5th Editions

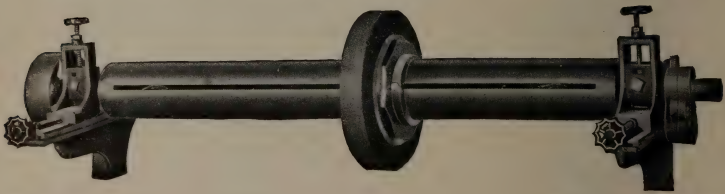
CHINA CLAY CO.

JOHN WILLIAMSON, Manager.
4 St. Annes's Square
MANCHESTER, ENG.

MINES—Ruddle, Bojea, Colchester, South Ninestones, Tronance, St. Austell, Cornwall.

CONTRACTORS TO H.M. INDIAN GOVERNMENT

"The Roy Patent Calender Roll Grinder"



B. S. ROY & SON, - Worcester, Mass. U.S.A.

PRESSES, HYDRAULIC or KNUCKLE JOINT

Heavy Duty Pulp and Baling Presses.

WILLIAM R. PERRIN & COMPANY, Limited,
TORONTO, Canada.

For Sale

Paper Machines,
Steam Engines,
Boilers,
Fourdriniers,
Press Rolls,
Dryers, Calenders,
Pumps, Heaters.

F. H. DAVIS & CO.,
161 Devonshire St.,
BOSTON, - - MASS.

C. D'Oyley Mears & Co.,
PULP and PAPER MILL EXPERTS,
PULP AGENTS and
EXPERIENCED "PULP" ARBITRATORS
Wardrobe Chambers, Queen Victoria Street,
London, E.C.

THE RIORDON PAPER MILLS,
Limited.
Merritton and Hawkesbury, Ont.
Merritton Mill—Newspaper, Hanging Paper, Wrapping Paper and Building Paper and Sulphite Pulp.
Hawkesbury Mill—Sulphite Pulp.

THE UNION SULPHUR COMPANY
PRODUCERS OF THE HIGHEST GRADE BRIMSTONE ON THE MARKET.
AVERAGE ANALYSIS: Sulphur, . . . 99.9 per cent.
Organic matter, .1 per cent.
Absolutely free from Arsenic, Selenium or Tellurium.
The Largest Sulphur Mine in the World.
CALCASIEU PARISH, - LOUISIANA.
Main Offices, - - - - - 82 Beaver Street, New York.

Norwood Engineering Company,
FLORENCE, MASS., U.S.A.

Builders of the highest grade of Paper Finishing Machinery, Rag Dusters, Belt Power Elevators, etc. Contractors for Filter Plants of any size, Industrial or Municipal, Gravity or Pressure system.

BALATA BELTING

Is known to be the best drive for Pulp and Paper mills.

We have the Genuine Article, Every Belt Guaranteed.

None Better.

Stretches less than other makes.

When you want quality, get our Samples and Prices.

Address nearest stock depot

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QUEBEC, - - ST. JOHN, N.B.,
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BARKER,
CHIPPER,
PAPER-CUTTER

MACHINE KNIVES
Of Every Description.

The Peter Hay Knife Co., Limited, Galt, Ont.

The PULP & PAPER TRADING CO.,
TEMPLE COURT BUILDING, NEW YORK CITY.
DEALERS IN
Paper and Pulp of All Kinds.
Prices and Samples on Application.

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JOHN KNIGHT & CO.,
CHINA CLAY IMPORTERS,
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Sole Agents for the .. .. L.G.V., W.F., ◇K◇ and other Brands of

CHINA CLAY.

L. G. V. is a natural Pure White, free from any artificial tinting.

For Coating, Bleaching or Fine Papers it is unsurpassed.

ESTABLISHED 1878

George E. Hanson

Expert Manufacturer of High-Class

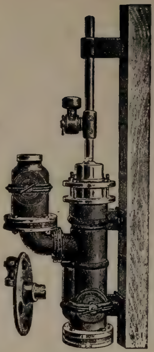
FELTS

FOR SULPHITE AND GROUND WOOD PULP MILLS

Only best of stock is used in making these goods. I am supplying some of the best Mills in Canada, among them being, The E. B. Eddy Co., Hull; J. R. Booth, Ottawa; James Maclaren Co., Buckingham, Que.; Nova Scotia Pulp Co., N.S.; Lake Megantic Pulp Co., Lake Megantic, Que.; A. J. Morrill, Nicolet Falls, and others.

A trial order would be appreciated.

HULL WOOLEN MILLS, HULL, P.Q.



STUFF PUMP

This pump is made in three sizes, 5", 6" and 8".

The valves are made so as to be easily and cheaply replaced and can be got at without using wrench.

We also make boiler feed and other pumps.

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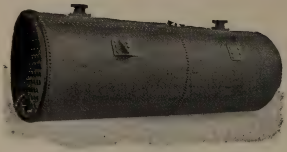

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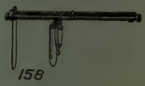

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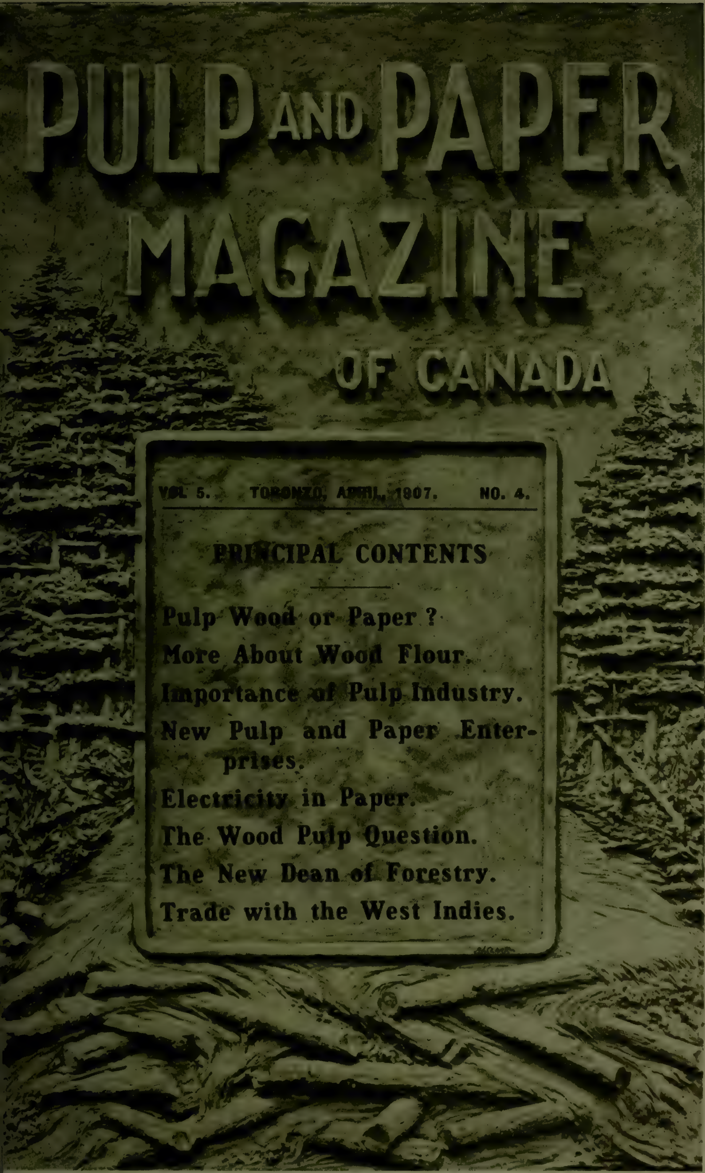

PULP AND PAPER MAGAZINE OF CANADA

VOL. 5. TORONTO, APRIL, 1907. NO. 4.

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More About Wood Flour.
Importance of Pulp Industry.
New Pulp and Paper Enterprises.
Electricity in Paper.
The Wood Pulp Question.
The New Dean of Forestry.
Trade with the West Indies.

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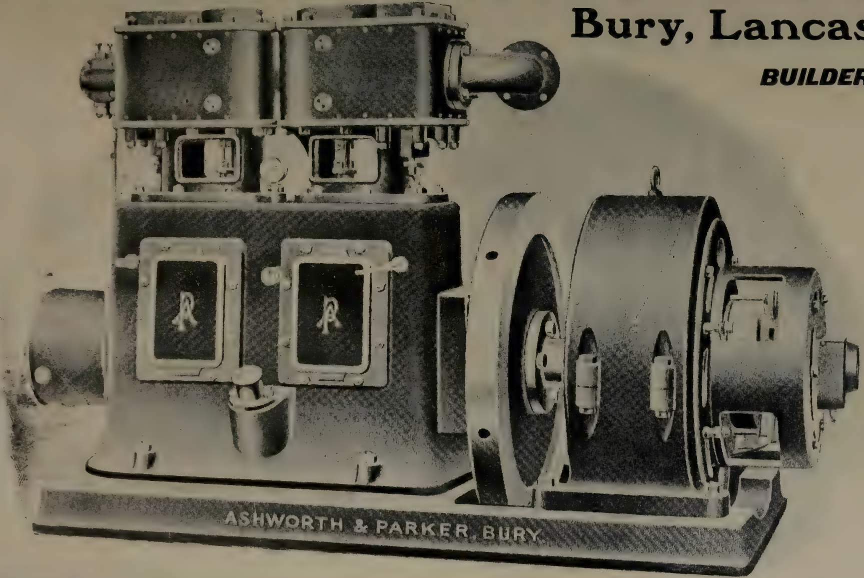

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OUR CATALOGUE of PAPER and PULP MACHINERY is the only one on the subject containing real information

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The paper and pulp imported into Canada for consumption in the seven months ending January last were as follows, the figures named representing the value of said goods under general, preferential, and surtax tariffs:

Albuminized papers and chemical films (photo.), $46,137, $9,253, $259.

Bags or sacks, $12,833, $1,026, $1,159.

Playing cards, $25,101, $31,796, $71.

Cardboard and pasteboard, $38,858, $4,747, $1,133.

Envelopes, $28,260, $9,818, $1,048.

Paper, felt or straw board, $155,105, $260, —.

Hanging or wall papers, including borders, $65,999, $8,198 $2,581.

Leather board, leatheroid, etc., $23,783,

Millboard (not straw), $31,229, $1,489, —.

Union collar cloth paper (not glossed or finished), $1,107; glossed, $358.

Pads not printed, papiermache ware, etc., $379,538, $95,218, and $32,450.

Patterns (boot and shoe), $602.

Printing paper of not greater value than 2¼ cents per lb., $4,916, —, —.

Prints not elsewhere specified, $200,453, $104,771, $3,566.

Ruled and border paper, $102,399, $33,603, $1,944.

Strawboard in sheets and rolls, $5,548,

Wrapping paper, $37,675, $6,285, $462.

Paper of all kinds, N.E.S., $380,817, $103,387, $6,574.

Wood pulp, $29,557, $421, $126.

Paper waste, etc., $253,095, —, —.

Exports from Canada.

Wall paper, produce of Canada, $9,326.

Paper (Canadian), $1,163,410.

Pulp-wood, $1,621,614.

Wood pulp, $2,243,875.

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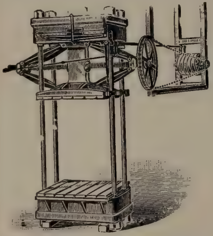

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—Senator Gibson brought up in Parliament the question of the duties on building paper. “One of the most important commodities used by settlers in the West. “He asserted the existence of a combine in that material through which consumers had to pay 100 per cent. more than it was worth. Hon. Mr. Scott pointed out that there was provision in the criminal law against combinations in restraint of trade, and these steamers will be mainly used for “bringing down large qualities of pulp-wood from the Canadian provinces.” Our friends had better face the facts, and acknowledge the strength of the Canadian situation as, indeed, many of them already do.

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All Colors for Paper

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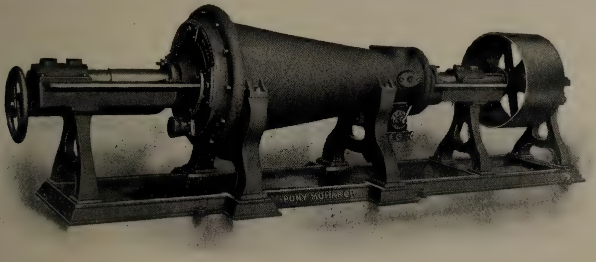

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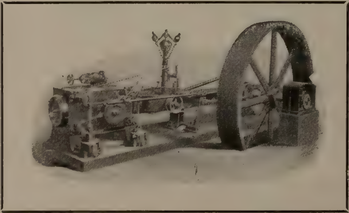

Because of its splendid governing qualities The Jenckes-Corliss Engine is especially suited for driving Paper Machines.

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THE
PULP AND PAPER MAGAZINE
OF CANADA

VOL. 5.—NO. 4. TORONTO, APRIL, 1907. $1 A YEAR
SINGLE COPY 10C.

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade.

SUBSCRIPTIONS: Canada, British Empire and the United States, $1 a year; to Foreign Countries, 5s. a year.

The Pulp and Paper Magazine is published on the third Tuesday of each month. Changes of advertisements should be in the publishers' hands not later than the 10th of the month. and, where proofs are required, four days earlier. Cuts should be sent by mail, not by express.

BIGGAR-WILSON, Ltd.,
PUBLISHERS

OFFICES, CONFEDERATION LIFE BUILDING,
TORONTO, CANADA.

PULP-WOOD OR PAPER?

That the public mind is becoming seized, though slowly to be sure, to the waste incurred by a country which exports its pulp-wood and imports its paper is indicated by the following article from the "Ottawa Citizen," in which it compares the conditions prevailing in two towns in Quebec Province:

In one of these towns is a rossing plant where wood is cut up, barked, put on cars and shipped to mills in the United States; 56,000 cords of pulp-wood passed through this mill last year. Employment was given to less than fifty persons. In ten years the change in the population of this town has been scarcely perceptible.

In the other town there is a paper mill. Last year about 78,000 cords of pulp-wood passed through this mill. Employment was given to over one thousand men. In ten years the population of this town has grown from 300 to 4,000. That is what the loss of our pulp-wood means to a community.

"The approximate value of labor expended upon a cord of wood to convert it into paper (from the time the wood is cut) is $10.66. The approximate value of labor on prepared wood going out of Canada (from the time the wood is cut) is $4.60. Six hundred thousand cords of wood were exported from this country in 1905. To have converted that into paper would have required an expenditure of $6,396,000. There was expended upon it in exporting it as pulp-wood $2,760,000—a loss to labor of $3,636,000. That sum would give permanent employment to 10,000 men at an average rate of $1.21 1-5 per day. That is what it costs Canada yearly to continue the present laws governing the pulp-wood industry."

MORE ABOUT WOOD FLOUR.

In recent numbers we have several times referred to the growing importance of a certain new industry, namely, the manufacture of wood flour. And we have mentioned that the methods of manufacture are very carefully guarded by the makers, owing to the large profit that they are able to obtain, by restraining the production of this material. The accuracy of our remarks is more and more demonstrated by the fact that the demand for this product is increasing at such a rate that the manufacturers cannot begin to fill their orders, and the users are in consequence now on the hunt for other sources of supply.

This has already resulted in many inquiries coming from English firms for quotations from Canadian manufacturers, as the English buyers are not aware that the industry has not yet been established in this country.

It is evident that Canadians could soon get a goodly share of this trade if they would only go into it, owing to the scarcity of suitable raw material abroad, for all that is not ground in the Scandinavian mills is imported in shiploads into England, where the flour is manufactured.

We are glad to receive from a valued correspondent, J. A. De Cew, chemical engineer, of Montreal, some further suggestive points in connection with the industry. This gentleman has made some recent investigations, and finds that there are two essential points to be considered in choosing the raw material to be used in its manufacture.

In the first place the wood which is to be pulverized, whether in the form of sawdust or chips, must be free from bark and otherwise clean. Next to this the important consideration is the color, and as a result only wood that will produce a white flour can be used.

The value of the material increases with the fineness to which it is ground, there being three grades, namely, 60, 40 and 20 mesh.

Some of the possible sources of raw material that we have in Canada for the production of wood flour are as follows:

All of the sawdust and chips from sawmills and wood working factories, which is both clean and white.

All of the coarse and fine chips that are removed in the sorting apparatus of a chemical pulp mill in the preparation of the wood for the digesting treatment.

The conversion of these waste products into a commodity that has about the same value as ground wood pulp, will certainly be an industry of some considerable profit, especially to those who get into it early.

A small plant can be put down for an investment of about two thousand dollars, which will produce five tons of flour in 24 hours. Of this flour there will be equal quantities of 60, 40 and 20 mesh.

These results, however, are only obtained by a special form of pulverizer, for particulars of which we would refer readers to Mr. De Cew, and not by the horizontal mill stones, which although they are sometimes used and make good flour, have a very small capacity.

On the other hand it is evident that our friends in the United States are not so fully persuaded as to the future merits of this material. Olin Scott, of Bennington, Vt., who is, we believe, the most extensive builder of gunpowder machinery in the United States, informs us that there are as yet only two small mills in that whole country. The consumption is chiefly for explosives.

We note that in the United States tariff wood flour is not dutiable either as wood pulp or as waste or by-product, but as a manufacture of wood.

IMPORTANCE OF PULP INDUSTRY.

The great importance of the pulp industry is not always fittingly recognized, it being quite a common habit among laymen to regard it as a minor branch of lumbering. An interesting comparison of the two industries was made at the recent forestry convention in Fredericton, N. B., by James Beveridge. He computed that the total amount of lumber, including deals and other products, cut in 1906 in the mills of New Brunswick approached 450 millions, board measure, having an estimated aggregate capital in plant and machinery of $2,250,000. The total estimated value of their products might be set down at $6,750,000, while they paid in wages $3,150,000. On the other hand, the total invested capital in plant and machinery in the four sulphite mills aggregated $1,850,000; their produce was worth $1,400,000 at the factory and they consumed 47 million feet of logs and paid $516,000 in wages. A comparison of these figures showed that in point of importance to the community the manufacture of chemical fiber easily took first place. This could be more readily demonstrated by taking 1,000 superficial feet of logs as the basis of comparison. For every 1,000 superficial feet there were paid at the mill $7 in wages, while at the pulp factory the amount was $12. The value of this product at the mill was $15, at the pulp factory $31.50, while the capital invested in the mill was $5 and in the pulp factory $41. That was to say the pulp mill paid 5-12 more wages to the State, produced a product of twice the value and had an invested capital eight times greater than the saw mill for every 1,000 superficial feet of logs respectively used.

⁂

—The sampling and testing of pulp has been a vexed question so long that anything calculated to bring about uniformity is a boon. As stated in our report of the American Paper Makers and Pulp Association, A D. Little, the official chemist of that body, is making a comparative study of the various methods of sampling wood pulp employed in various mills on this continent. He points out that the methods in general use are liable to serious mistakes. There is no doubt the establishment of some standard official method would conduce to the removal of a good deal of possible friction between buyer and seller. It is to be noted with satisfaction therefore that, according to "Farmand," the Swedish paper trade organ, an international commission of chemists is to be appointed to carry on investigations with the object of establishing uniform methods of analysis in relation to chemical and mechanical wood pulps. Mr. J. Sebelien, of the Aas Landbrugshoiskole (of the College of Agriculture, Christiania) has been appointed president of the commission.

⁂

—If any further proof were needed of the fact that the Americans are yearly becoming more absolutely dependent on their northern neighbors for a supply of pulp-wood, it is furnished by the news which reached us lately from Portland, Me., regarding the lease of certain wharf property in that city for a term of years. This is to provide accommodation for a new line of steamers to run between Portland and St. Lawrence ports for the purpose of bringing down pulp-wood from Canada.

NEW PULP AND PAPER ENTERPRISES.

The Anglo-Newfoundland Development Company have definitely decided to erect pulp and paper mills at Grand Falls, Newfoundland. They will, it is stated, erect a great water-power plant on Exploits River, about 275 miles from Port Aux Basques. Together with the mill, the work of construction is expected to extend over a period of from two and one-half to three years. The head of the power plant will be 126 feet from the base to the top, and will have a drainage area of four thousand square miles. The Anglo-Newfoundland Company has at its head Mr. E. Beaton, of London, Eng., Alex. Wood, of Halifax, being treasurer.

* * *

The Bayliss Paper and Pulp Company of Binghampton, N. Y., have started work on the new saw mill and rossing mill at Beaupre, Quebec. In addition to the work of sawing timber, pulpwood will also be rossed at the mill and shipped to several points.

* * *

A company in which Geo. McAvity, of St. John, N. B., and Mr. Stetson, of Boston, are prominently interested, are likely to establish large pulp and paper mills on the banks of the Tobique River. A deal has been concluded between the Murchie Lumber Company and the New Brunswick Pulp and Paper Company, by which the latter concern acquired posession of the extensive timber limits on the Tobique formerly owned by the Murchie Company. These areas contain an immense quantity of timber suitable for pulp-wood.

* * *

A pulp mill is proposed to be built on Anticosti Island, in the Gulf of St. Lawrence, which is said to be covered thickly with good pulp-wood.

PULP AND PAPER NEWS.

The Soo Pulp Mills have been inconvenienced by ice.

* * *

The Canada Tag and Label Printing Company, Montreal, lost $50,000 in a fire.

* * *

Barber and Ellis, wholesale manufacturers of envelopes and paper, are opening a branch at Winnipeg.

* * *

A bill has been introduced in Quebec Legislature to amend the charter of the Metabetchouan Pulp Co.

* * *

The St. George Pulp Company, St. Stephen, N. B., will call for tenders for the erection of a steel and concrete sawmill.

* * *

D. K. McLaren, Limited, Montreal, capital $250,000, have been incorporated to carry on business as manufacturers and dealers in textile and pulp and paper mill supplies.

The printing and box rooms of the Lincoln Paper Mills are working as usual, power being furnished by a threshing engine.

* * *

A few days ago there was a convention of the Canada Paper Mills staff at Windsor Mills, Que., when at the banquet about fifty plates were laid.

* * *

A boiler furnishing steam for the digesters at Miramichi pulp mill at Chatham, N.B., blew up, but fortunately not very much damage was done.

* * *

The Manning Wood Fibre Company's factory at Owen Sound, Ont., including considerable machinery, has been destroyed by fire. Loss about $6,000.

* * *

The Canadian Glue Company, Brantford, Ont., has obtained the Canadian rights to manufacture and sell "Ivory" size, which is claimed to be better than rosin size.

Pulp and Paper News—Continued.

The B. Greening Wire Company, Hamilton, Ont., have a permit for a $12,000 addition to their factory.

* * *

The Riordon Paper Mills, Limited, whose mills are at Merritton, Ont., will change their head office to Montreal.

* * *

The British Canadian Lumber Company, Limited, has been granted a charter empowering it to build works for receiving and keeping and delivering pulp-wood.

* * *

The Canada Pacific Sulphite Pulp Co., Limited, is asking the British Columbia Government for a special license to cut and take away timber from certain lands on North Roderick Island.

* * *

The Eclipse Safety Paper Company, Limited, Ottawa, has been incorporated. Capital $50,000. It will manufacture and deal in safety paper, do business as printers, bookbinders, etc.

* * *

Buntin, Gillies and Company, Limited, Hamilton, Ont., wholesale paper dealers and manufacturers of paper specialties, expect to be settled in their new premises on John Street S., by May 1st.

* * *

The British America Pulp, Paper and Railway Company are applying for an Act to extend the time for the completion of their lines, and for power to increase the bonded privileges and to issue preferred stock.

* * *

The Canada Paper Company is closing its camps at Stoke and St. George, St. Camille, for the season. They will have, says the Sherbrooke "Gazette," about 11,000 cords of pulp-wood coming down the river this spring.

* * *

It is interesting to note that J. R. Booth was 80 years of age on the 5th inst. We need not inform our readers that the great lumber, pulp and paper veteran is as fit for business as ever and that he still makes every day a busy one.

The Harricana Lumber Company, Hull, Que., has been incorporated for the purpose of building and operating paper and pulp mills. F. A. Gendron, of Hull, A. E. Hitchcock, Ottawa, and Mr. Joannis, of Maniwaki, are interested in the project.

* * *

The Ottawa Government has made new regulations regarding permits to cut timber on Dominion lands, in order to restrict unnecessary waste in cutting, to prevent the destruction of trees not required at the moment and to lessen the chances of fire.

* * *

William Barber and Bros., Georgetown, Ont., who have been in the paper manufacturing business since 1852, have been converted into a joint stock company with a capital of $100,000, the provisional directors being J. R., F. J., C. H., and R. R. Barber and G. H. Kilmer.

* * *

A syndicate of Minnesota, Michigan and Northern Ontario capitalists represented by H. H. Jones, Victoria, B. C., has purchased about 60,000 acres of land on the west British Columbia coast, and will spend, it is said, half a million dollars in erecting saw mills, etc., in that region.

* * *

The Smart Bag Company, Limited, Montreal, capital $2,500,000, has been incorporated for the purpose of manufacturing paper and other kinds of bags. C. A. Smart, C. E. Archibald, Abner Kingman and F. Howard Wilson, of Montreal, and J. W. Woods, of Ottawa, are interested in the project.

* * *

On 28th ult. the big 3-inch cable in which the pulp of the James McLaren Company is conveyed from the mill on the west side of the river to the pulp shed on the east side, broke. The large tower at the east end of the pulp shed snapped in two and crashed through the roof of the shed. The men who were working near received a bad scare when the crash came, but fortunately no one was hurt.

Pulp and Paper News—Continued.

The Ontario Government sale of pine on berth 32, range 10, north of Curtis Township, Algoma, created a good deal of interest, and it was very lucrative. There were twelve tenders, that of E. B. Foss and Company, of Thessalon, being accepted. This was a bonus of $10.52 per thousand, b. m., Crown dues $2. The square timber brought $350 per thousand, and $50 dues.

* * *

In the case of Diehl vs. Imperial Paper Mills, the English courts decided that the company had power to issue £100,000 mortgage debentures, secured on a charge upon all property comprised in the indenture securing £200,000 coupon bonds, and in priority thereto. At a meeting of coupon bondholders last month it was decided to allow all interest due thereon to accrue until July 1st, 1909.

* * *

At the annual meeting of the Canada Paper Company, Montreal, the following board of directors were elected: Sir H. Montagu Allan, Hugh A. Allan, H. S. Holt, Bryce J. Allan, H. Markland Molson, C. R. Hosmer, and the Hon. Robert Mackay. At a subsequent meeting the following were elected officers: President, Sir H. Montagu Allan; Vice-President, H. S. Holt; General Manager, F. J. Campbell.

* * *

The news from Sturgeon Falls is to the effect that the rise in the river has been very welcome to the Imperial Paper Mills. During the month of March this year the river has been exceedingly low, lower perhaps than it has ever been known. This has interrupted the work at the mills quite a little but with the present spring weather the mills anticipate steady running for the rest of the year. During the last few days some exceptionally good runs have been made both in the paper mill and the sulphite mill.

* * *

The St. John Pulp and Paper Company in considering their lease of the Mispec mill from the City of St. John, N. B., complain of the trouble they have had through insufficiency of water, and threaten not to renew unless the city will give a guarantee of more water. The city claims that any shortage in the water lately has been due to the extra severity of the winter, and would in all probability not occur again. The company may possibly either get an extended lease or acquire the mill and establish some plan of water storage. It is suggested that the rental shall be $2,500 per year, and this seems likely to be accepted, either by Mr. McAvity or Mr. Cutler.

ALUMINA FOR SODA PULP.

In making paper pulp from straw, wood and other celluloses, the raw material is treated with caustic soda, says a writer in Bulletin Journal des Fabricants de Papier. This leaves the cellulose nearly pure, the spent lye carrying off the resins and other impurities. The spent lye is evaporated and the residue is ignited, leaving a grayish mass of sodium carbonate mixed with carbon. This is used for caustic soda manufacture. If a natural aluminous earth—such as bauxite, which contains ferric oxide, silica, titanic acid, etc.—is added to the spent lye in a finely divided state, the evaporation and incineration leaves a mixture of carbonate and aluminate of soda, both soluble in water, and pure hydrate of alumina is precipitated from the solution by passing carbonic acid through it. The residual solution of bicarbonate is decanted, and used for the preparation of caustic soda, as it will not bear concentration. The amount of bauxite, the only natural aluminous earth of importance in this connection, which has to be used depends on the analysis of it. An average analysis gives 12 per cent. silica, 5 per cent. titanic acid, 60 per cent. alumina and 2 per cent. of ferric oxide. In any case the amount of bauxite should be regulated so as to give a trisodic aluminate, or even a more basic aluminate in certain cases. If only very little bauxite is required the lye can be dispensed with.

ELECTRICITY IN PAPER.

In the course of a keen discussion on the subject of paper at a meeting of the Printers' Managers and Overseers Association a month or two ago, complaint was made of the difficulties experienced in the machine-room sometimes by electricity in the paper. One or two different methods that had been tried for overcoming it were mentioned, but none claimed to do more than minimise the trouble. Static electricity was but little known and of slight consesequence before the advent of high-speed presses, points out a writer in the "American Printer," and when its influence was at all appreciable, he says, "it was usually attributable to friction or suction." Both terms were applied for want of a better name. Magnesia was supposed to be an excellent remedy for the trouble in these early days, and one could frequently observe pressmen industriously applying the powder to the fly and other supposed points of frictional contact. With the introduction of rapid printing machinery the trouble grew to a great extent and became actually distressing in some cases. It was soon discovered that a more potent factor was exerting its influence on the paper, and those who took the time to investigate were not long in discovering the presence of static charges. The cause suggested numerous remedies. Many of these were applied with indifferent success, but the continued presence of the trouble to a greater or lesser degree stimulated a number of inventors to action. This resulted in the issuance of patents on a variety of devices and methods during the period intervening between 1898 and 1905. Many of these were based upon the theory of dissipating atmospheric electricity by providing means to preserve uniform atmospheric conditions in the press-room during the entire year. The idea underlying two or three of these inventions was inspired by the modern theory of atmospheric electricity, according to which it is removed by the condensation of steam or aqueous vapours. . . . But it is pretty generally recognized that the process of condensing steam only minimizes the trouble. A favourite method consists of arranging a steam pipe with a series of small jets across the press cylinder. In this manner the printed sheet is sprayed with dry steam as it passes from the cylinder to the delivering tapes. Those who have experimented for the mere purpose of finding some means to prevent off-setting have given but little attention to static electricity as a principal cause of the trouble. The hot-air process is the result of an endeavor to attain this end." But the result of this likewise is but to minimize the static charge.

In view of these incomplete cures of a trouble that is a source of much annoyance and serious delays in the machine-room, printers will be interested to learn that an American electrical engineer (William H. Chapman) has patented a device that is claimed to remove all troubles caused by electricity. If paper were a conductor the methods we have referred to above might answer the purpose, but, being an insulator, with the electrical charge thoroughly meshed in its fibre, it must be forcibly ejected, as one would squeeze the juice out of a lemon. If the electrical charge of the paper is negative, it must be forced out or neutralized with a positive charge. Mr. Chapman has put this theory to a practical test as applied to static electricity in the press-room, and has produced a device that we understand is doing efficient service in a number of large American offices. It is thus described in the above-named journal: "It consists mainly of a transformer supplied with current from an alternating lighting system. There is a primary coil of 200 or 360 turns of coarse wire and a secondary coil consisting of 40,000 to 50,000 turns of very fine wire. When the voltage of the primary is 110 the voltage of the secondary becomes about 22,000 volts. A non-inductive resistance coil limits the output of the secondary coil and thus obviates the dangers of this very high voltage. A conductor extends across the cylinder at the point of the sheet delivery, which is supplied with an alternating current of high voltage from the transformer. The primary coil of the transformer may be short-circuited by means of a suitable switch. The action of the current is governed by a switch with four segments, so that more or less current may be passed through the primary current of the transformer, but the resistance coil is always in and cannot be cut out, and thus the resistance is sufficiently great to prevent a dangerous amount of current from passing at any time. The alternating current is thus transformed to a high voltage current and this, transmitted through a wire, neutralizes the static electricity of the paper which automatically selects and becomes neutralised by the charge of opposite polarity in the alternating charge."

The inventor thus describes the problem he had to solve : "Practical experience during the last two years with the alternating current as applied to this problem has proved conclusively that this is the only natural and adequate method of dealing with these unstable forces and conditions, and that a stable and neutral condition can thus be forced in an absolutely complete and effective manner. The alternating current, as its name implies, has in it both kinds, positive and negative, and in the presence of such a current the charges on the paper become their own destroyers, under the law of like and unlike. Under this law the charges on the paper, whether positive or negative, whether in patches or uniform over the whole sheet, become self-selective and draw out of the alternating current the kind and quantity exactly to neutralise them.The air, being an insulator, would under ordinary conditions prevent any interchange of charges between the paper and a conductor carrying the alternating current, so that it is necessary to provide a medium for the conveyance of these charges across the intervening space. This medium is easily supplied by ionised air produced by the action of points, attached either directly to the alternating conductor or to pieces of metal in its vicinity. When the hand is placed before a point so located, a breeze is distinctly felt, which represents a stream of electrified air particles or ions, as they are called, which act as carriers and convey charges across spaces of several inches and at a rapid rate, so that it is by no means necessary to have any material object touching the paper to effect its complete neutralisation : as a matter of fact the inductor bars, as they are called in this system are usually located so that the paper will pass by them at a distance of a couple of inches, and it is usual to have only one of these inductor bars on a printing press and have it located as near the delivery end as possible, so that the paper does not have an opportunity to pick up any more charges by friction or bending or pressure before being laid on the pile, where it will then lie perfectly smooth and free from the sheet below it."

IMITATION PAPER CLASPS AND MOUNTINGS.

Clasps, mountings, buckles, corner-pieces for book-covers, door-plates, etc., usually made of metal, can be very well imitated with paper stamped out of the proper shape and thickness, and bronzed and varnished afterwards. Ornaments in high relief must be stamped hot, but low reliefs can be stamped cold if the material is thin.

To imitate old iron, the stamped-out articles are first painted over with thin glue and thoroughly dried. . . . When dry they are painted with a dark brown distemper color, and while still wet are dusted over with any finely powdered brown pigment having the same color as iron-rust. When this has been uniformly done, the goods are dried and heavily brushed with a hard brush, so that the imitation rust is completely removed, except from the crevices and deep-lying parts. The raised parts are next polished with agate, if the price permits. Edges and reliefs are then gone over with a brush charged with aluminium bronze in a gum arabic vehicle, so as to imitate the polished places produced by wear on the raised parts of genuine ironwork. Old bronze and copper are imitated in the same way, except that the dusting is done with a green pigment to produce the patina effect, and the painting with copper bronze instead of aluminium bronze.

Imitations of oxidized metal in red, blue, green, etc., are produced by using a black ground color, over which silver bronze is dusted or painted. The raised parts are then lightly painted by means of a brush with a bronze of the desired color in a gum arabic vehicle.

There is, of course, nothing to prevent the articles from being ornamented with real or artificial gems or with medallions, and for good work drying oil can be substituted for the gum arabic. Leather board is the best kind of paper material in all cases, and the process can be extended beyond the production of ornaments or of protective pieces to be fixed on to a larger object. Thus, cardboard done in poker-work can have its edges treated as above described, and this can be done either before or after the poker-work has been executed.—Papier Zeitung.

SOME PAPER "DEFECTS" EXPLAINED.

It sometimes happens that colored cotton stuffs, when wrapped in paper and stored away exhibit loss of color after a time. The color fades in places, leaving a spotty or patchy appearance, says Professor Herzberg. This trouble is usually put down to the unfortunate wrapping paper, and it is concluded that the cotton stuff must have been attacked by some deleterious material contained in the paper, such as acid, chlorine, or coloring matter. Why should the wrapping paper be made the scapegoat without further enquiry? It is just as likely that the loss of color has originated in the cotton itself, say, on account of unstable coloring matter, action of fibre on the color, and so forth; or in external influences, such as the action of light and air. A satisfactory answer would no doubt be difficult to find, but it is a curious fact that whenever a material comes in contact with paper, and trouble arises, the paper is always to blame, often without any justification whatever.

If the ink runs or penetrates the paper on which we are writing, of course it is the paper that is at fault, and it is usually concluded without further consideration that it must be badly sized. It seldom occurs to us to blame the ink, although this is just as likely to be the cause of the trouble.

The same occurs when difficulties arise in printing. If the paper tears or does not take the color, it is always the paper which is at fault, and the other materials, such as color and varnish, or the machine, or even the workman himself, are never blamed.

If steel articles get rusty, of course it is the paper in which they are wrapped which caused the trouble. Without further ado the paper is declared to contain free acid, which is the cause of the rust. It is hardly ever realized that the paper may be in no wise at fault, and that the rust may be brought about by unsuitable atmospheric influences. The same thing applies to silver or plated goods wrapped in paper. Because the goods are packed in paper, therefore the paper must be the cause of the blackening!

When a blotting fails to blot after having been in use for a short time, and no longer absorbs the ink as it should, all sorts of evil properties are attributed to it. Yet the ink may possibly contain large quantities of solid substances which in a short time may clog up the pores of the very best blot ting paper; but this, of course, is an absurd view to take.

There is no difficulty in multiplying instances where the patient paper takes all the blame. Possibly these examples will suffice to point out the peculiar and unjustifiable trend of thought in blaming the paper wherever possible. Is it too much to hope that in future, when questions of such a nature arise, all the circumstances may be taken into consideration? It is worth pointing out that a cursory examination of the bales would have shown that the fading of the cotton goods was not due to the paper, for in those places where the cotton had been pressed closest to the paper—as, for instance, in the lowest layer of the bale—no change of color could be detected, but the fading took place wherever the material came in contact with the air, and a thorough examination showed subsequently that warm, moist air alone acted on the color. In particular, it was extremely susceptible to the action of air containing traces of nitrous acid—the color then disappeared in a very short time. The bales were stored in a room where gas was burnt; and, as such air always contains traces of nitrous acid, there was no difficulty in explaining the fading of the color.

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SWEDISH WOOD PULP SILK PAPER.

Sweden has achieved a wide and well-deserved reputation for its silk papers. A Swedish correspondent, well versed in their manufacture, has informed us that the secret of their success lies in three points: long boiling, moderate steam pressure, and a not too alkaline lye. The wood fibre must be carefully selected, and then chopped up into lengths of at least three-quarters of an inch. The grinding must be done in the pug mill, and the hollander has only to work with soft brushes and cards. The attendant of the hollander must recognize the working of his machine by its sound—as a choirmaster leads his choir—and know thereby at once when the process is finished. Additions of inorganic substances must be avoided to get the best results.

A soft, long-fibred stuff will give an excellent product on the Yankee or Oechelhauser machine. In the Yankee machine great attention must be paid to the scrapers. The uppermost scraper must be of brass, or, if possible, of phosphor bronze; the lowest of steel. The intermediate one must be of wood, and should be cut across the grain and be freely supplied with water.

The foregoing remarks form the foundation of all the secret processes at present in use, but it must not be forgotten that practical experience is required to supplement theoretical knowledge in all branches of manufacture whatsoever.

✱

DIRECTORY OF PAPER MAKERS.

The 1907 edition of the Directory of Paper Makers of the United Kingdom is to hand, and makes a very valuable addition to the library of everyone interested either directly or indirectly in the paper trade. The typography is clear and well arranged, and the contents very complete so far as we can judge. Among the book's chief features are the following: Lists of paper makers of the United Kingdom, under all the various headings carefully and authentically revised to date. Additions to the list of trade designations, used as watermarks, etc., in papers, stationery, etc., bringing the total to over 7,000, of infinite value to printers and stationers; paper trade customs; a classification of advertisers, forming in itself a complete Directory of paper makers, principal engineers, purveyors of raw materials, paper mill, etc., suppliers, etc., etc.

This useful book is published by Marchant, Singer & Co., 47 St. Mary Axe, London, E.C., and the price is 1s. 4d. post free in the United Kingdom, or 1s. 6d. abroad.

THE WOOD PULP QUESTION.

By R. W. Sindall (London, England).

The great differences which are frequently found in the tests made of wood pulp are, of course, familiar not only to papermakers, but also to the manufacturers of pulp. The conditions under which the material is sampled and tested just after manufacture are so radically different from those which occur in the paper mill that a few brief notes on the subject may be of some value to our readers.

The sheets of pulp leaving the hydraulic press are comparatively dry in the centre and very wet at the edges, as shown by the following test made by the writer when visiting some mills in Canada:—

Test Made.—A sheet of pulp was taken from a pile of sheets which had been removed from the hydraulic press about an hour previously. This was divided into three equal areas, **a, b, c,** as shown in the diagram. Each piece was weighed accurately in the wet state and then dried in an oven at a 100 degrees centigrade. The figures obtained are set out in the table as under:

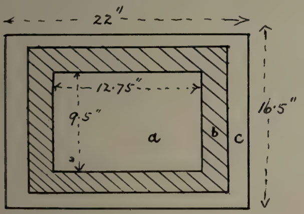

Fig 1.

Piece.	Area, sq. inches.	Wet wt. grammes.	Absolute dry wt. grammes.	P.c. of absolute dry pulp.	P.c. of air-dry pulp
c	121.4	752	350	46.5	51.66
b	120.5	698	350	50.1	55.66
a	121.1	610	315	51.6	57.40
		2060	1015	49.4	54.90

The distribution of moisture in this case is very different from the distribution of the moisture in the bales on arrival at a paper mill in England. The excess of moisture on the outer edges is dispersed, either by partial evaporation into the air, or by absorption or redistribution in the other portions of the bale, so that the differences are not so marked if the pulp is tested in England. This does not affect the actual dry air content of the bale, but the gross weight will vary more or less as the bale has been exposed to the air in a manner which favors evaporation.

In testing pulp at the pulp mill, the manufacturer is well advised not to draw samples from the wet sheets immediately they are manufactured, but to allow some few days to elapse before drawing samples in order that the great differences indicated above between the outer and inner portions of the sheet may be reduced by the natural reabsorption of some of the moisture from the outer edges of the sheet by the inner portions.

The distribution of moisture in the sheets of the bale, especially in pulp which has been stored in a warehouse, is generally irregular, and the following test can be applied to show this:—

The sheet of pulp is divided into a number of wedges having equal angles at the centre, as shown by the diagram. If these wedges are each carefully weighed moist and then in an absolutely dry condition, these differences will at once be apparent.

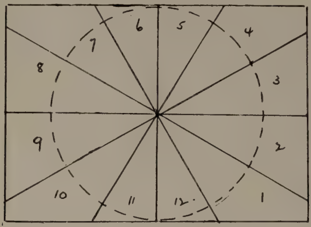

Fig 2.

It can be shown mathematically that the wedge does represent the rectangle or square sheet from which it is cut, so that the sample test suggested above will be interesting. From this it might follow that a wedge drawn from a wet sheet immediately it leaves the hydraulic press should give as good a result as a wedge drawn from a sheet two or three months later.

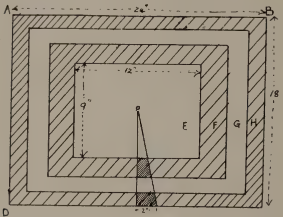

Fig. 3.

Whatever may be one's opinion as to the accuracy of any particular method of sampling pulp, the principles of the wedge ought to be thoroughly understood. The writer of the present article had occasion recently to demonstrate the exact relation of the wedge to the rectangle, and illustrated the case by a specific example.

Let A, B, C, D represent a sheet of air-dry pulp of uniform thickness, measuring 24 inches by 18 inches. Divide this sheet into four equal parts —E, the inside portion; H, the outer portion; and F G, intermediate portions.

The division of the whole sheet in four equal parts is accomplished easily enough, as shown in the accompanying table:—

			Sq. in.
Area E	=	12" × 9"	= 108·0
Areas E + F	=	16·975" × 12·73"	= 216·09
Areas E + F + G	=	20·785" × 15·585"	= 323·95
Areas E + F + G + H	=	24" × 18"	– 432·0

Sq. in.
E = 108·00
F = 108·09
G = 107·86
H = 108·15

Total = 432·10

Note.—The slight differences are immaterial, being due to small fractional errors

The dimensions of the various rectangles are all proportional—that is the ratio of the length to the breadth is the same in all cases, viz., 24 : 18.

Now, to get a sample from the sheet which shall represent the whole we can take equal areas from each of the pieces E, F, G, H; but in practical testing such a course is impossible, as it would necessitate marking the exact position of the "lines of separation" before the small pieces of equal area could be cut. Another alternative would be to cut a quarter sheet from the whole—an equally impracticable scheme. If, however, in the specific case under consideration we can show that the wedge gives four equal-sized pieces from the four areas E, F, G, H, then the objection to the wedge as representing the full rectangle cannot be sustained.

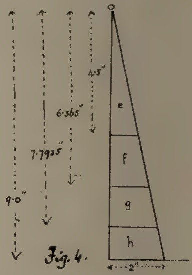

Fig. 4.

Let such a wedge having a base of, say 2 inches be drawn as shown in Fig. 1. Let Fig. 2 represent the wedge on an enlarged scale, consisting of the four areas, *e*, *f*, *g*, *h*, representing the pieces E, F, G, H in Fig. 1. Now the area of the whole sheet is 24 inches by 18 inches, or 432 square inches, and the area of the wedge is that of a triangle whose height is 9 inches and whose base is 2 inches. The area of any triangle is one-half the base multiplied by the height, and hence the wedge contains 9 square inches, or has an area of one forty-eighth part of the whole sheet (432 ÷ 9 = 48).

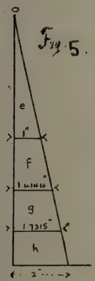
Fig. 5.

In the wedge we have a series of triangles, viz. : (1), The triangle *e* ; (2), triangle consisting of pieces, *e*, *f*; (3), triangle consisting of pieces *e*, *f*, *g* ; (4), triangle consisting of pieces *e*. *f*, *g*, *h*. By calculating the area of each triangle we determine the exact size of the separate pieces *e*, *f*, *g*, *h*.

We must know the exact length of each base first. These are easily determined from the relation :—

(1)

$$\frac{\text{Base of triangle } e}{\text{Base of triangle } (e,f,g,h)} = \frac{\text{Height of triangle } e}{\text{Height of triangle } (e,f,g.h)}$$

$$\frac{\text{Base of } e}{2} = \frac{45}{9}, \text{ giving } 1{\cdot}0 \text{ inches.}$$

(2)

$$\frac{\text{Base of triangle } e, f}{\text{Base of triangle } (e.f,g,h)} = \frac{\text{Height of triangle } e, f}{\text{Height of triangle } (e,f,g,h)}$$

$$\frac{\text{Base of } e, f}{2} = \frac{6{\cdot}365}{9}, \text{ giving } 1{\cdot}4144 \text{ inches.}$$

Fig. 3 gives the calculated lengths of the bases of the triangles. The areas of the triangles are then :—

(Area of a triangle = $\frac{1}{2}$ base × height)

			Sq. in.
Triangle *h*, *g*, *f*. *e*	has area	$\frac{1}{2}$ (2 × 9)	= 9
" *g*, *f*, *e*	" "	$\frac{1}{2}$ (1·7315 × 7·7925)	= 6·75
" *f*, *e*	" "	$\frac{1}{2}$ (1·4144 × 6·365)	= 4·50
" *e*	" "	$\frac{1}{2}$ (1 × 4·5)	= 2·25

From the above figures the areas of the pieces *e*, *f*, *g*, *h* are :—

e = 2·25 square inches.
f = 2·25 " "
g = 2·25 " "
h = 2·25 " "

If any experimental proof is needed, it can easily be obtained by drawing the figures shown on a piece of stout cardboard to the dimensions indicated. Equal areas cut from a dry board of uniform thickness would be equal in weight. If the wedge is carefully cut into the four sections shown, the pieces will be found to be equal in weight.

TRADE ENQUIRIES.

The following enquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these enquiries, with their addresses, can be obtained upon application to Superintendent of Commercial Agencies Department of Trade and Commerce, Ottawa.

324. **Papers.**—A paper agent in Glasgow desires to obtain the agency for Scotland, the North of England and Ireland for Canadian paper mills shipping news, printing, manillas, box boards, brown wrappings or sealings. Commission 2 to 2½ per cent., according to value of paper on all transacted and paid for. Terms usually one month, payment inside two, but these subject to arrangement.

NEW BRITISH COLUMBIA COMPANIES.

The following companies have been incorporated under British Columbia charters for the purpose, among other powers, of building and operating pulp and paper mills.

Paterson Timber Company; Hill-Tout Lumber Company; British America Lumber and Trading Company; North British Columbia Exploration Company; Victoria Tie and Timber Company; Perfection Pressed Stone Company; Prince Rupert Investment Incorporation.

The following companies interested in the stationery, book, and lithography businesses have been recently incorporated in British Columbia:

G. A. Roedde, Limited; Smith Davidson and Wright, Limited.

THE NEW DEAN OF FORESTRY.

We are very glad, in announcing that Dr. Bernhard Eduard Fernow has been appointed Dean of the new Department of Forestry in Toronto University, to be able to give a few particulars of the life of one to whom forestry on this continent owes so much. He was born in Prussia in 1851, the son of a high government official, and studied forestry at the Forest Academy at Munden and law at the University of Koenigsberg, entered the army and went through the Franco-German campaign, becoming a being the establishment of the policy of Lieutenant of Reserves. For six years he was in the Prussian Forestry Department. He visited the United States in 1876, and became the Chief of the Forestry Division in 1886. During his administration the basis was laid for the development of forestry in the United States, the most important step taken now about 150 millions acres are reserved and managed with a view to conservative lumbering. The small beginnings of 20 years ago, when the division had an appropriation of $10,000, have forest reservation in 1891, under which

Dr. B. E. Fernow.

grown to a big department with more than $1,000,000 to support it, and the expectation that it will soon be self-supporting. In 1898 Dr. Fernow, who holds an LL.D. degree from Queen's, and also from the University of Wisconsin, organized the first college of Forestry at Cornell University, resigning his position in Washington in order to devote himself entirely to professional lines. His conception of a forester being that he is a lumberman, educated as a logger as well as a planter, he began logging operations on the demonstration forest in the Adirondacks, which the State had given to the college as a practice and demonstration ground. This procedure incensed the sentimentalists and rich summer camp owners, and they managed to have the appropriations for the college cut off by a veto of Governor Odell. Since then Dr. Fernow has acted as Consulting Forest Engineer in private capacity making forest surveys, advising lumber and mill companies, bankers and other timber land owners. Last winter, when the State of Pennsylvania proposed to establish a forest school, Dr. Fernow was called to the head of it, but the wider field opening up in Ontario induced him to make the change, as a result of which we are now welcoming him to Canada. It is proposed to organize a school of forestry at the University of Toronto that shall be second to none, and the good-will of limit-holders should go out to the new institution. We may mention that several of Dr. Fernow's graduates have achieved remarkable success in not only a professional but in a commercial way. When he first organized the Cornell College of Forestry in 1898, it was still a doubtful question as to how the graduates would be disposed of, while now they cannot be supplied fast enough. There is no doubt that the existence of a class of technically educated men creates their own employment. There are probably 200 such now in the United States and more are constantly needed by the Government and private concerns.

THE PLANT OF THE NOBLE AND WOOD MACHINE CO.

The Noble & Wood Machine Co., Hoosick Falls, N.Y., when our representative recently called upon them, very courteously showed him through their shops, where there was much to be seen of interest to paper makers. In their carpenter shop were six Beating engines nearly completed, and four more newly started; several board machine vats, stuff chests, thrashers, etc., everything showing the "ear marks" of careful, painstaking workmanship, and the highest class materials. The tubs and vats made of Gulf Cypress, with its beautiful graining, seemed much too handsome to put into any mill.

In the machine shop every inch of floor space was taken up with new machines in course of construction, but the large number and different sizes of their Jordan engines particularly attracted attention. They build the smallest and largest Jordans made, besides two intermediate sizes. Their "Pony Monarch" Jordan is the smallest size, having a capacity of ten (10) tons (dry weight) in twenty-four hours; next comes the "Monarch" Jordan, twenty-four (24) tons; then the Mammoth jr. Jordan, thirty (30) tons; and finally the "Mammoth," forty (40) tons. The capacity of these Jordans is very conservatively figured, and in many known cases a 25 per cent. increase is secured This, of course, depends very much on the mill conditions, kinds of stock used, and the individual preferences of each mill as to the treatment of the stock. They recommend a speed of 350 R.P.M. on all their Jordans. In some cases they are run slower with good results. In their opinion a Jordan which has to be run at a higher speed than 350 R.P.M. is an expensive luxury on account of power requirements, to say nothing of the additional wear and tear on the Jordan.

An opportunity was given of examining the interior construction of the Jordans, which is the key-note of their value. The strength of the Jordan is in the manner of filling the plug. Nothing but the highest grade crucible steel bars are used in Noble & Wood Jordans, and sound, thoroughly seasoned oak filling. The plug is made of one continuous casting, and the construction is such that it is impossible for the bars to become loose, and so simple that any ordinary mechanic can fill them at the mill. We were astonished at the solidity of the plug, even before the woods were fitted and driven. The thing that appealed to us as very sensible was the fact that while most manufacturers have projections rolled on the flat surface of the bars, these people have a series of holes punched through the bars, into which the wood swells, and also below the bottom of the bars ; by this method the wood fits the entire surface of the bar. It is impossible to drive kiln-dried hard wood over a projection and have it fit the entire surface of the bar. This appealed to us as a very simple and effective way of securing rigidity in the filling.

The depth of their steel filling is so great that after three chippings there is still as much steel left as is found in many Jordans when new, and enough wood left to hold it perfectly solid. Another indication of the long wear of the filling is the distance the plug can be thrust into the shell as the filling wears, which is 16 inches and over. They say many cases are on record of their Jordans running three and four years without refilling, and in some cases on rough stock for two years and over. This means economy for the mills.

The operation of refilling is extremely simple and is done by the mills themselves with only a few hours loss of time.

Shafts are of the very best hammered steel.

Bearings babbitted with water boxes.

Sleeves of heavy brass.

Base or slop bowl a heavy continuous casting, catching all grease and water.

Heads are fastened with turned bolts, all entirely outside of shell where no water can get to them. No threads to rust.

A large sand settler is so located as to catch all heavy material before it can enter the knives ; made in two compartments so that it can be opened and foreign material taken out without stopping the Jordan.

The pulley end bearing is placed on adjustable ways, and each Jordan is provided with a centering gauge which enables operator to keep the plug central at all times ; a very important point.

All Jordans are ground to a perfect surface before shipment.

There is another point the Noble & Wood Machine Co lay great stress on, and that is the power requirements of their Jordans. They claim that in this respect they surely stand in a class by themselves, having repeatedly shown the low power requirements of their Jordans in competitive tests with others.

They are surely a very heavy, powerful well-built machine, and although they have been built for fifteen years, we are informed that there never has been a second-hand one on the market.

They have recently added $15,000 worth of new tools to keep up with their orders, which they say have been pouring in upon them actually without solicitation, each one the result of the good advertisement of Jordans in operation.

Their foundry is also a large well equipped department, filled with work like all the rest of the shop, and hustling it through in a businesslike way, which was good to see.

All those in need of machinery should write this well-known firm.

SPECKS IN PAPER.

The most careful made paper is liable to contain tiny specks. As long as they are inconspicuous or so rare that they can be got rid of by the rejection of a few sheets it is of no practical importance to ascertain their cause, says "Papier - Zeitung." Sometimes, however, the specks are both conspicuous and numerous, so much so as seriously to affect the sale of the paper. In such cases it is of great moment to ascertain their causes, so as to discover means for their prevention. These causes are very numerous, and specks of very different origin are often so much alike that only chemical or microscopical investigation will distinguish them. Once the composition of the speck has been ascertained it is often possible to infer its cause, but it is also often essential to know the local conditions under which the paper was produced, and the nature of the manufacturing process, to show at what stage of the manufacture the specks entered or to what defect in the raw material they owe their origin.

Specks can be classified in three main groups :

(a) Those appearing darker than the paper by reflected and lighter than it by transmitted light.

(b) Those appearing darker, or of a different color from the paper, by both kinds of light.

(c) Those invisible, or barely visible, in the freshly made paper, but which are developed in the subsequent processes.

The first group includes rosin and grease marks, scum, and sand marks, and knots in the fibre, and also specks due to minute pieces of silicified or calcified vegetable cells or of starch granules due to defective preparation of the pulp.

The second includes iron, bronze, lead, carbon, dye, sealing wax and rubber stains, as well as dyed fibres, splinters of wood and straw, husks of cotton seeds and mold stains.

The third comprises knotted fibre, residues of bleaching powder or calcium sulphite, of starch, iron, rosin, grease and sand, and also small pieces of filling materials and woody fibre. Rosin specks are known by being removed, or at least losing in transparency, when treated with ether. They often develop the characteristic odor of rosin when touched with a hot wire. If the stain is not entirely removed by ether, the remainder generally contains iron, and also bodies of unknown origin which dissolve to a brown solution in caustic soda. There may be also a white nucleus consisting of clotted fibre or of mineral matter, such as gypsum, kaolin, etc. In the former case the fibres can be separated by caustic soda, and examined microscopically. Rosin stains come either from the wood pulp or from the size. In the former case they are usually larger and more irregular, and less soluble in alcohol or ether than when they come from the size ; but exceptions occur, and if there is no information about the manufacture or the raw materials used, it may be impossible to ascribe the true origin. If, however, the stains are found to contain gypsum or calcium sulphite, they can generally be put down safely to the wood pulp.

Grease specks are very similar to rosin stains, but are usually more sharply outlined, and unremovable by cold alcohol. The grease dissolves in ether or benzine, and the stain loses its transparency ; but the presence of copper or iron generally makes itself seen after the grease has been removed. The stains generally come from the lubricators of the hollander rolls or other machinery.

Scum specks are mostly small depressions, which are sometimes surrounded by a raised ring. In smoothed paper this ring is often somewhat more transparent than the enclosed space, and in rare cases has a different color from the rest of the paper. As these stains are due to frothing during sizing, the ring, which is caused by the bursting of a bubble, sometimes contains rosin. There is, however, a number of stains showing no specially characteristic features, which are called scum marks. Whether they are or are not due to frothing is very rarely ascertainable by examination of the finished paper.

Sand stains include those due to grains of sand, fragments of mica and similar bodies. They also include marks, which, although they contain no foreign bodies, are caused by minute particles imbedded in the rollers. In this case the marks are repeated at regular intervals. Stains actually containing sand, etc., are inconspicuous by reflected light, and, if the sand is white or nearly so, also by transmitted light. The holes made by grain imbedded in the rollers are very plain by both sorts of light. The holes are nearly always irregular. The sand may come from the mill water, from the wood pulp (i.e., from the grindstones), or from filling materials. If some grains can be isolated, which is best done by drawing the paper over a sharp edge, the microscope will usually reveal their origin. Grains of felspar or mica usually come from filling materials, and those of quartz from the water or the grindstone. To make quite sure, the filling materials ought to be examined. There is one special kind of sand mark which occurs in pairs. The pair is due to two grains, one imbedded in the upper calender bowl, the other in the lower, in such relative positions that they make their marks close together.

WHITE PULP.

Albert Gagedois, of Don, France, has been granted a United States patent for the production of white pulp.

Hitherto the production of pure white pulp for use in paper making has only been possible by using raw material which was white at starting and not much soiled.

The process which forms the object of this invention enables pulps of pure and brilliant whiteness to be obtained by employing wood, hemp, jute, phormium, aloes, and other similar vegetable products in the natural state, white or colored rags, old ropes, and other waste material, even if colored, as also the white waste material from spinning works, hitherto exclusively employed for manufacturing white pulps. In order to effect this bleaching of materials, hitherto regarded as not capable of being utilized in the manufacture of white pulps for use in making white paper, the natural vegetable products are subjected to the following operations preparatory to the bleaching: First, one or more lyewashings with lime or with soda, followed by a thorough washing, in the first place with acidulated water when lime lye has been used, and then with fresh clean water, so as to obtain a neutral pulp free from reagents; secondly, chlorination, in the case of wood pulps. This chlorination is followed by the necessary washings with pure water in order to obtain a neutral pulp. The bleaching is then effected, the materials which have been treated with lye or with lye and chlorin being beaten for four to six hours in a bath constituted as follows: In the necessary quantity of clean cold water for well moistening the pulp to be converted into paper two to three kilograms of alkaline peroxid per hundred kilograms of material are dissolved, according to the quality of the material and the extent to which it is prepared for bleaching. To this solution ten to thirty kilograms of neutral alkalin silicates of 5 degrees Baumé are added for each one hundred kilograms of material.

The function of the alkalin silicate is to retard the decomposition of the peroxid and allow the liberated oxygen to act gradually on the pulp to be bleached. This it does, in part, by obstructing the decomposition by heat and in part by thickening the mass, and thus obstructing the free escape of the nascent oxygen and compelling its contact with all of the particles of the pulp.

During the heating, which is continuous, the temperature is gradually raised to about 80 degrees centigrade. This increase of the temperature is only intended to effect the decomposition of the peroxid in the baths which does not contain any reagent, so that the oxidation is carried on gradually throughout the material without injury to the pulp under treatment. The alkalin silicate employed will be neutral, and it will not react on or affect the alkalin peroxid. The heat alone decomposes the peroxid, and the alkalin silicate merely acts mechanically to retard, as above explained. The pulp is then washed with clean cold water and subjected to the following operation: First, soaping in a tub or trough provided with a stirrer; secondly, chlorination, followed by the necessary washings for eliminating all traces of chlorin.

If the materials employed in the manufacture of the white paper are waste colored fabrics, the lye washings are preceded by a decoloring operation consisting in beating the said fabrics in a solution of nitric acid of 2 degrees Baumé containing 15 to 20 per cent. of the said acid. The decoloring operation is followed by a washing with clean cold water.

BRITISH PAPER MAKERS' ASSOCIATION.

The Paper Makers' Association of Great Britain and Ireland (Incorporated) held a meeting on Feb. 28th under the chairmanship of Capt. Edward Partington, in the absence of Sir John Evans, K.C.B., etc., the President.

It was stated that negotiations had been pending for some time with the railway companies in order to obtain a more favorable classification of paper-making materials. A deputation of paper makers waited upon the railway managers and urged that gelatine (used as size) and rosin for paper making should be included in the alkali list, also starch for paper making. It was also desired that mill wrappers should be classified as paper-making material and gas blue charged as vegetable tar. The railway companies, however, could not see their way to make any alteration in the present classification.

In respect to sampling and testing of wood pulp, it was reported that the sub-committees, representing the various associations, had received particulars of tests made by chemists, and they had decided upon a method of testing, which would be recommended to the several associations for adoption. The matter was not discussed to any extent, but was left over for further report.

It was stated in the report that the continued increase in the price of raw materials, especially during the first six months of the year, had been a very serious matter to the British paper industry, as there had been no general advance in the price of paper to compensate for the rise, except as regards one section of the trade. The only advance in prices was made by the brown mills.

A more optimistic note was struck by the chairman at the banquet in proposing the toast of "The Allied Trades and Visitors," that while some countries had natural advantages for producing wood pulp and mills located in the area were well placed, yet he thought paper makers in Great Britain inherited the natural gifts which enabled them to well hold their own. The Britisher exported as well as imported paper, and he thought they would go on expanding, perhaps not quite so rapidly as in the past, but satisfactorily. They were the first to take advantage of esparto. and in the matter of wood pulp as far as its practical utilization in the manufacture of paper was concerned, they were many years ahead of other countries.

STRAW CELLULOSE.

M. D. Giaj-Tenna describes in the "Revue de la Papeterie" a process for the manufacture of straw cellulose. It consists in subjecting a straw, during treatment, not only to the action of alkalies, but also to that of clay, alumina, borax, of albuminous substances (casein), of amylaceous substances (fecula, flour), of gelatinous ones or of gums.

All these substances, having the property of uniting with alkalies to form a cement or mastic, give a remarkable resistance to the fibres. By using only clay, alumina or borax with the alkalies, the fibre becomes stiff and brittle, almost like glass; but by adding a small quantity of some albuminous, amylaceous or gelatinous substance, a mastic is formed which will, on the contrary, keep it tough and flexible.

The treatment with alkalies and albuminous, amylaceous, etc., substances, without clay or borax, also gives the straw tenacity and flexibility; but it is advantageous to add clay or borax to give the fibre more strength, and to increase the conversion into cellulose, probably because insoluble compounds are formed with the lime and soda. It is a good plan to use kaolin as a clay, to avoid the impurities which attack the straw, although coloured papers can be made by using any clay whatever. The fibre may be given more resistance by substituting borax for kaolin; the best pulp for making fine and extra fine papers is thus obtained. For other papers, it is economical to use kaolin with a small quantity of borax, or kaolin only.

The alkalies to use with kaolin, borax and one of the organic substances (albuminous, amylaceous, etc.), may be carbonate of soda, caustic soda, potash and quicklime, which are already used in paper making. It is, however, advantageous to use carbonate of soda and lime.

The respective quantities of the different substances to be put into the lixiviator depend upon the quantity of straw (which may be wheat, rye or oat, tough or pliant, with knots or without), upon the steam pressure and upon the duration of the process. The steam pressure can be that ordinarily in use in paper mills; the duration of the treatment will be four hours or more, according to the pressure, the quantity of chemicals, the form of the lixiviator.

Of albuminous, amylaceous, gelatinous substances casein is preferable, because it gives with the alkalies (lime and carbonate of soda) the best mastic; but under favourable conditions fecula of potatoes (potato starch) may be used, which has about the same property, and is very much cheaper than casein. A pulp with a very strong fibre can be obtained by using for each 100 kilogrammes of straw:

Carbonate of Soda	8 to 10 kgs.
Lime	6 to 7½ kgs.
Borax	½ to 1 kg.
Kaolin or Clay	2 to 2½ kgs.
Fecula (starch) or casein	1 to 1½ kgs.

The lixiviation of the straw with the above-named substances may be accomplished with whole straw or with straw run through a cutter; and the lixiviators may be closed (turning or fixed) or they may be open boilers.

It is, however, better to cut the straw to obtain an economical and perfect result.

When the lixiviation is finished the pressure is allowed to fall and the liquid is removed. Hot water is then introduced into the lixiviator to give the straw a preliminary washing; then the whole is discharged from below into a reservoir with a double bottom, with holes to dry the straw.

Numerous experiments have shown that 100 kgs. of straw will give from 53 to 58 kgs. of cellulose bleached and dried, the quantity depending upon the degree of lixiviation and of bleaching. The yield is positive, and need not be thought exaggerated in view of the fact that cellulose from straw is made in every paper mill, by the ordinary process with carbonate of soda or caustic soda, yields only 40 to 50 per cent.

This process is so simple that any paper mill may employ it.

It is also applicable to esparto, and to Spanish grass to obtain the corresponding cellulose, and to jute and cotton rags to give them a greater resistance.

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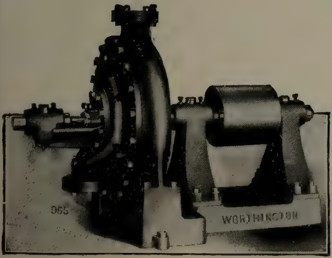

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TRADE WITH THE WEST INDIES.

J. D. Allan, A. E. Jones, and H. B. Schofield, were delegates respectively of the Toronto, Halifax, and St. John Boards of Trade, who visited the West Indies recently for the purpose of investigating the prospects of trade between Canada and the Islands. The following items from their report will prove of interest to readers of the "Pulp and Paper Magazine."

Straw paper of French origin was found to be in common use for wrapping purposes in all the Islands, and in British Guiana, Canadian wrapping paper and bags are being introduced, and are securing a portion of the trade. There is a good opening for Canadian fine writing materials.

In lumber Canada suppplies nearly all the demand, spruce and white pine being shipped direct from Maritime Province ports, while Ottawa white pine is generally imported via New York

Speaking generally, the delegates say that Canadian manufacturers and exporters should make more systematic and determined efforts to place their goods before the buyers in the West Indies, who are regularly canvassed by American and English salesmen or resident selling agents, while Canadian goods only are spasmodically placed before them. Several Canadian firms have secured a good share of trade and a satisfactory increase annually, by persistent endeavor to supply what is wanted and to study details.

PAPER SERVIETTES.

Paper serviettes have now become a current article in the German paper trade in spite of objections raised against them by many conservative persons, remarks "Papier Zeitung." They have almost entirely replaced textile serviettes in many restaurants, coffee-houses, and confectioners' shops in the Fatherland. One of their chief recommendations is that they are so cheap that they can be discarded when dirty. Few textile articles are so liable to become stained as serviettes, and to get rid of the stains on a linen or cotton serviette is not only troublesome, but as often as not is impossible without irreparable damage to the fabric. It must not be forgotten, too, that the prompt destruction after use which awaits a paper serviette conduces extremely to sanitation. When the paper has been sharply stamped with artistic designs, the paper serviette leaves nothing to be desired on the score of appearance.

As regards the methods of manufacturing paper serviettes, they are numerous. The paper employed is generally silk-paper. The design is printed upon them by means of engraved rubber rollers, or they may be subjected to the action of a goffering machine only if no design is required. Most of the paper serviettes used in Germany are of home production. Austria, however, supplies a certain proportion. It is curious to note that Japan imports large quantities of unprinted paper serviettes from Germany, and re-exports them printed with Japanese designs. At the same time Germany imports paper serviettes entirely of Japanese origin to the value, at present, of about £25,000. The German exports of printed paper serviettes go mostly to Switzerland, Austria-Hungary, England, Scandinavia, Belgium, Russia, and South America.

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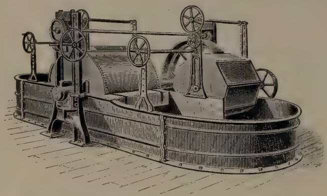

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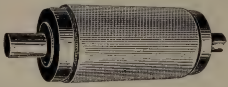
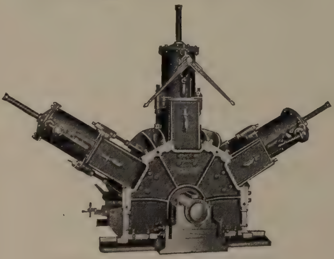


Cotton and Paper Rolls with Patent Fastenings.



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Machinery for Wood Pulp and Paper Mills.

Vertical and Horizontal Water Wheels with Flumes and all connections.

Wood Barkers, Wood Chippers and Wet Machines.

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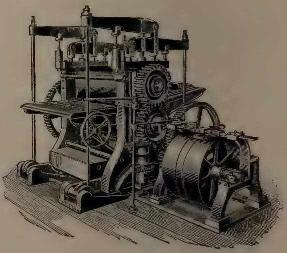

Description and Estimates Furnished; also Gear List and Catalogs sent on application.

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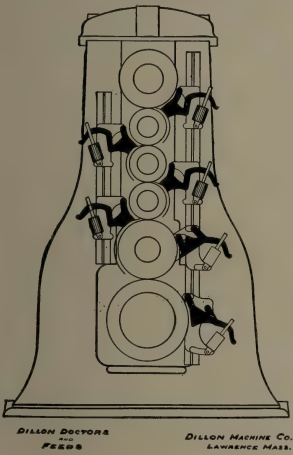
PAPER MILL MACHINERY



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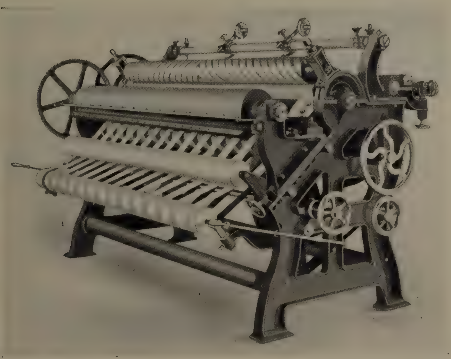

LAWRENCE, MASS., U.S.A

THE MARKETS.

Canadian Pulp.—The pulp industry is in an uncomfortable position. Wood is very scarce, and the shortage of water at many mills renders it difficult both to grind what they have and to get further supplies of logs. Heavy spring rains are needed.

Pulp in many cases it is almost impossible to obtain at any price. Ground wood is easily worth $25, while sulphite fetches $50. It is hoped that the situation will become more normal by next month, but there does not seem to be much expecetation of lower prices.

Paper. — The paper manufacturers have awakened to the situation in earnest, and realize that they have been selling their product in too many cases below cost of production. Prices have been raised from ¼c. to 1c. per pound, so as to equalize profits on certain lines as much as possible. Prices of bags continue quite uneven. Demand for all classes of paper continues good.

British.—Prices for prompt shipment of mechanical are very firm at 45s per ton c.i.f. Market for chemicals is good. Easy bleaching sulphite is scarce. Not much soda pulp offering, and prices are well maintained.

Chemicals.—Market is steady with a rather quieter tone. "World's Paper Trade Review" quotes prices as follows: Bleaching Powder (soft wood) stands at £4 12s. 6d. to £4 15s.; Caustic Soda, 76-77 per cent., £10 10s. f.o.b. Liverpool; Ammonia Alkali, 58 per cent., £4 10s. to £4 15s.; Soda Crystals, £3; Salt Cake, £2; and Recovered Sulphur, £5.

All grades of china clay in brisk demand, also French chalks, mineral white, etc.

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If you are fond of fishing, canoeing, camping, or the study of wild animals look up the Algonquin National Park of Ontario for your summer outing. A fish and game preserve of 2,000,000 acres interspersed with 1,200 lakes and rivers is awaiting you, offering all the attractions that Nature can bestow. Magnificent canoe trips. Altitude 2,000 feet above sea level. Pure and exhilarating atmosphere. Just the place for a young man to put in his summer holidays. An interesting and profusely illustrated descriptive publication telling you all about it sent free on application to J. D. McDonald, Union Station, Toronto, Ont.

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* * *

—The British Customs returns for 1906 show that Becker & Co., London, cleared in their own name no less than 151,002 tons of pulp of value of £538,989, or more than the total quantity brought in by any eight other importers. Of this, 121,641 tons were mechanical pulp, but it is a fact that Becker & Co. headed the list in the importation of chemicals also. Their surplus in mechanical over all competing firms last year was no less than 77,637 tons. Besides which it must be remembered that several of their largest customers cleared pulp in their own names, and some lots were cleared in the name of shipping agents.

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Pulp and Paper Handbook of Canada

This Directory will give full information regarding the pulp and paper mills of Canada, the officers, managers, superintendents, capacity, power used, particulars of machinery, kind of power used, products of each mill, and selling agents, if any. Also all the available information to the time of going to press of new mills projected; paper box factories, paper bag manufacturers, wholesale paper dealers, jobbers, bookbinders, etc.

THE REVISED CANADIAN TARIFF as it affects the pulpwood, pulp and paper industries, pulp and paper machinery and mill supplies will also be given; also the tariffs of the U.S. and Newfoundland.

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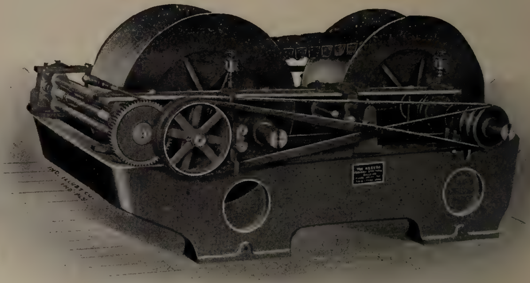

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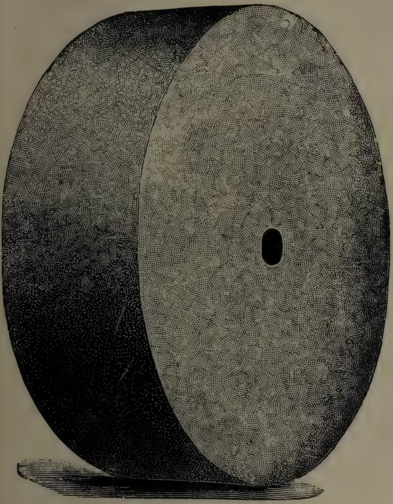

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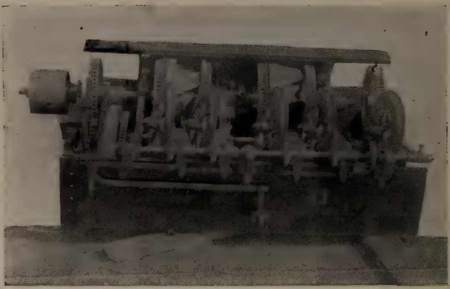

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Peels wood of all dimensions, 3 inches up and of all lengths from 36 inches up.

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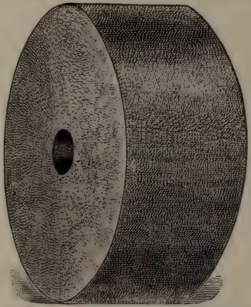

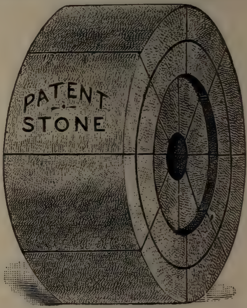

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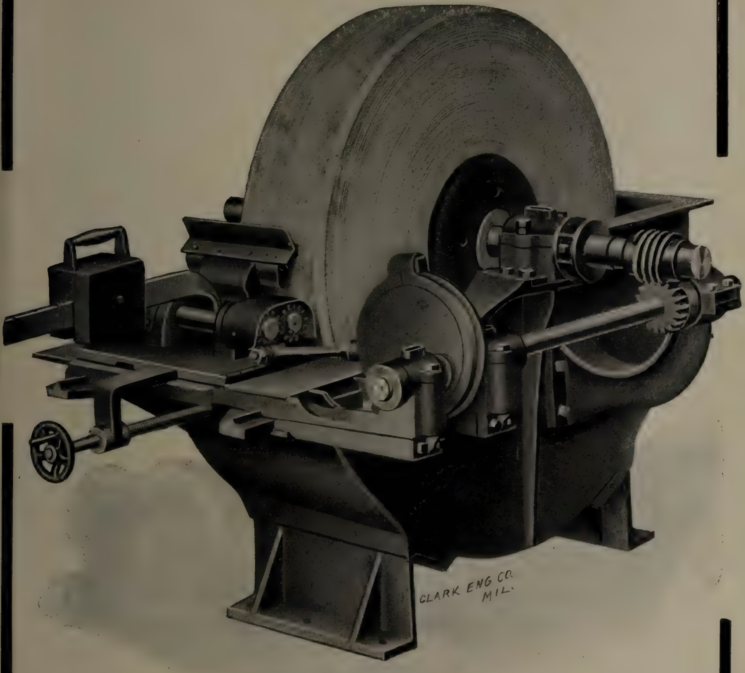

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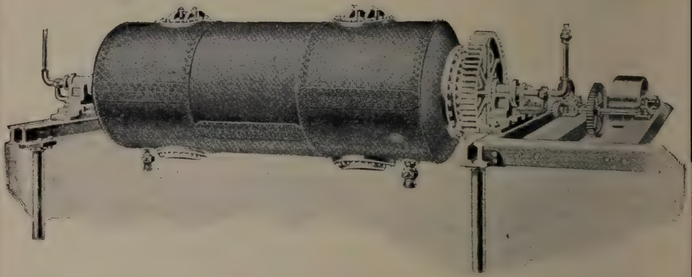

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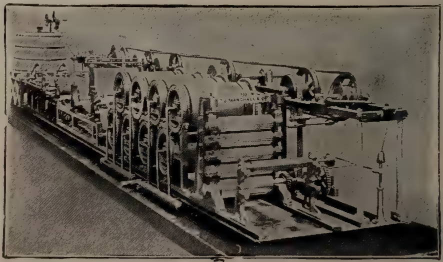

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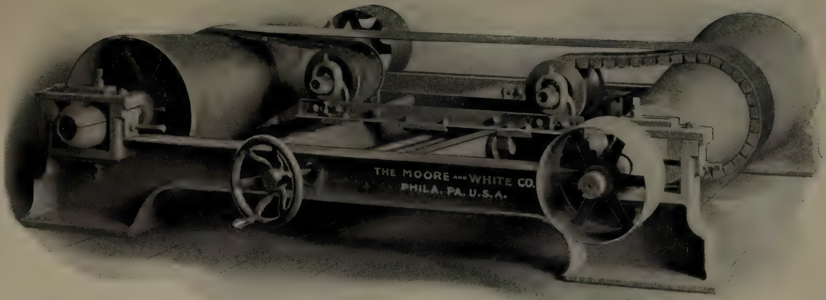

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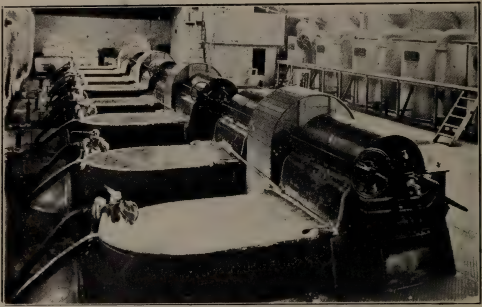

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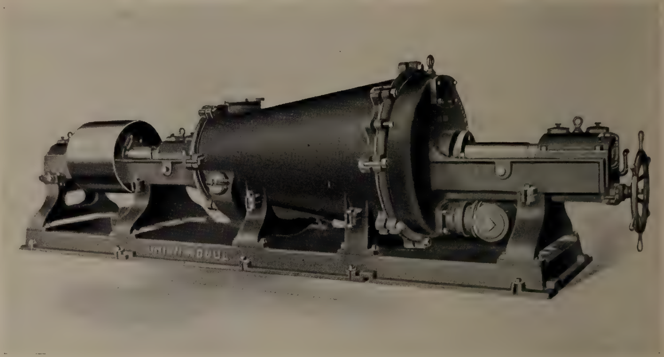

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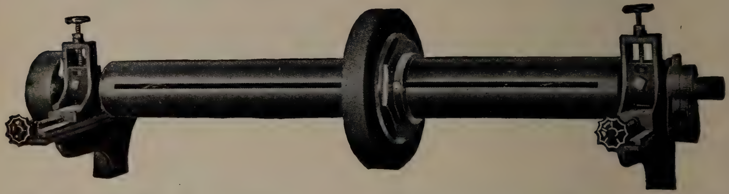

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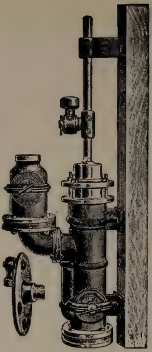

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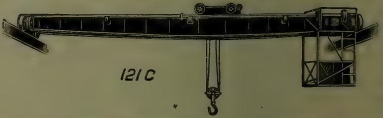

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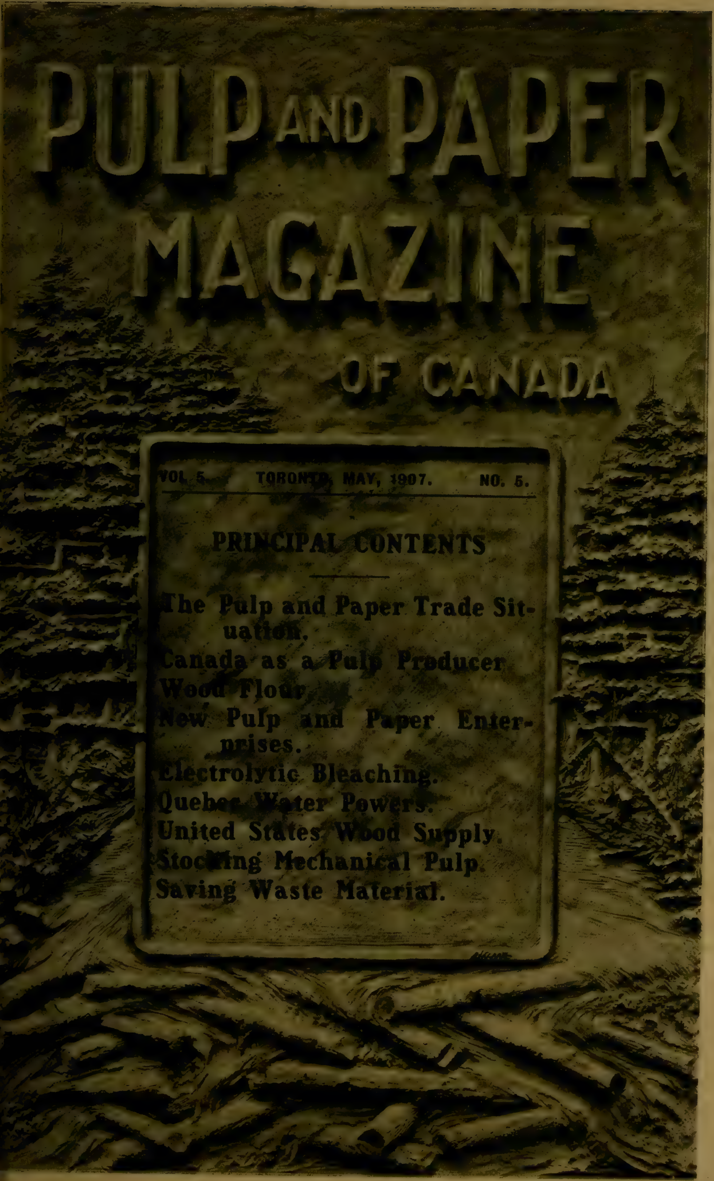

PULP AND PAPER MAGAZINE OF CANADA

VOL. 5. TORONTO, MAY, 1907. NO. 5.

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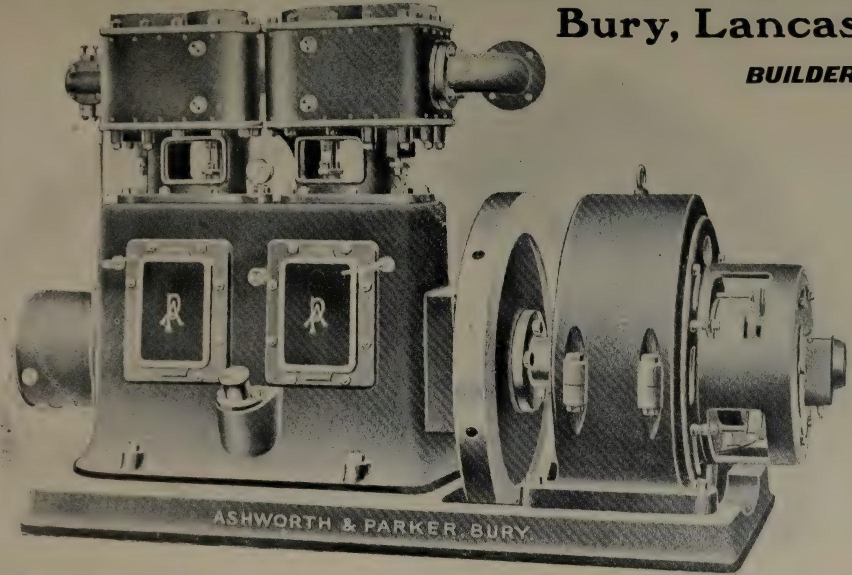

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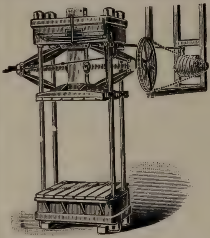

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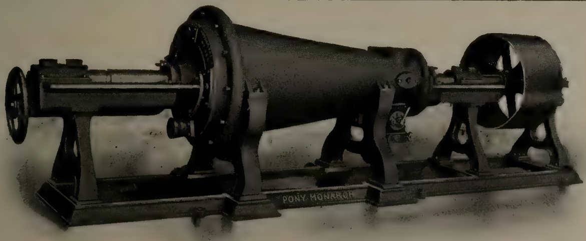

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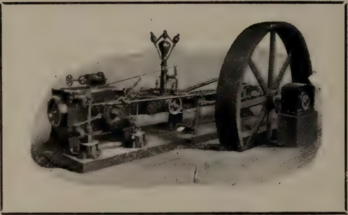

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THE
PULP AND PAPER MAGAZINE
OF CANADA

VOL. 5.—NO. 5. TORONTO, MAY, 1907. $1 A YEAR / SINGLE COPY 10c

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade.

SUBSCRIPTIONS: Canada, British Empire and the United States, $1 a year; to Foreign Countries, 5s. a year.

The Pulp and Paper Magazine is published on the third Tuesday of each month. Changes of advertisements should be in the publishers' hands not later than the 10th of the month, and, where proofs are required, four days earlier. Cuts should be sent by mail, not by express.

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PUBLISHERS
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TORONTO, CANADA.

PULP AND PAPER TRADE SITUATION.

The situation of the pulp and paper industries of Canada and the United States at the present moment is interesting and, in some respects, unique. The conditions for getting out pulpwood during the past winter in Canada have been ideal in most quarters in Eastern Canada. To use the expression of a prominent pulp manufacturer, if it had been in the power of the pulpwood people to order the weather and snowfalls and water for their special benefit it could not have been planned more favorably than the combination has actually worked out. Moreover, the lateness of the spring and the gradual disappearance of the snow by soakage instead of by freshet has ensured a fuller and more prolonged period of high water in the rivers for the summer than for a long time past.

Unfortunately for the pulp manufacturers in the States the conditions are exactly reversed there, and in the Wisconsin region and the Adirondacks the situation is acute. In the first named district something has happened which has never occurred in the history of the industry—that is, the pulp manufacturers have had to draw their supplies all the way from Quebec. Up to the beginning of last month the mills there had purchased 70,000 cords of Quebec pulp-wood, and this aggregate has increased to 100,000 cords at the date of writing. They have had to pay from $7 up to $7.50 per cord at stations in Quebec, and by the time it reaches the mills in Wisconsin it will cost them $14 to $15 per cord. In New York State some of the mills are badly off for both wood and water. The Burgess Sulphite Fibre Co., to cite a case, is producing only 150 to 175 tons per day, where its capacity is 260 to 300 tons. The conditions are not so bad in Eastern Maine as in New York.

This state of affairs in the chief pulp manufacturing districts of the United States is sending both sulphite fibre and ground wood sky-high, and, along with pulp, paper is on a level which is giving many people deep concern. Contracts are now being taken in Chicago for quantities of 5,000 to 10,000 tons of news at $2.40 to $2.50 and over, and it is predicted that it will not be long before that class of paper is selling at three cents a pound. Sulphite fibre has advanced $12 a ton since September, 1906—a rise of 50 per cent; and the result has been unprecedented importations into the United States of sulphite pulp from Scandinavia. Had some Canadian manufacturers two or three years ago started to equip up-to-date sulphite mills for the export trade, as advised by the "Pulp and Paper Magazine," these importations would have been made from Canada rather than Norway and Sweden. But the trade of the future is still awaiting the Canadian mills that have the enterprise to go into the business.

On the whole, the present situation ought to reveal to those who have the shaping of the forestry and pulp-wood policy of the country the opportunities that have already been lost—but not lost beyond redemption—for preserving such potential resources for the Canadian people. Had the past administration of the Province of Quebec been faithful to its trust the water powers and pulp-wood interests of the Province would not be in the danger they are now in, nor would its great material resources be diverted as they now are to build up the industries of a foreign country.

The differing conditions in the two countries are not explainable by freaks of the weather, for in the case of the United States it is now realized, too late, that the wholesale destruction of forests caused by the enormous demands of the printing press have brought about the double trouble of dear wood and unstable water supply. A country bare of forests means a country where freshets prevail in the spring and low water in the summer; and if the present process of depleting Canadian forests for the supply of American pulp mills is maintained a few years longer the habitable part of Quebec will be damaged incalculably, not only as regards the paper industry, but all other industries depending on water-power. And since Quebec has no coal its water-powers are the more vital to its industrial future. How long will it take the public men of this country to realize that what has already happened in the United States will happen in Canada if the same unregulated destruction of timber goes on? It is not a question of retaliatory duties affecting the pulp and paper trades, but a question of industrial self-preservation, because, upon the permanence of our water-powers depends the primacy of this country in manufacturing in every line.

CANADA AS A PULP PRODUCER.

The fact is becoming daily more patent that the United States, in spite of an occasional demur of some parties in that country who think their interests are hurt by the confession, will have to depend absolutely on Canada for its supply of pulp-wood at an early date. A statement issued by the Washington Department of Agriculture throws additional light on the wisdom of Ontario in preserving her pulp resources for the benefit of home manufacture. Strictly speaking, however, it refers more particularly to Quebec Province, upon whose pulp-wood the four neighboring States of New Hampshire, Maine, Vermont and New York mainly depend. These States supply over two-thirds of all the pulp produced in the United States, and to do this it required, in 1905, nearly thirteen hundred million feet of timber. Of this enormous quantity the Province of Quebec contributed nearly 30 per cent. In six years, including 1905, the increase in the spruce pulp-wood imported from Canada has been 83 per cent., while the quantity of pulp-wood produced in these four States decreased from 1905 to 1906, and this decrease is bound to continue. Therefore, the export from Quebec is bound to increase, especially in view of the fact that a large mill in Wisconsin has already made contracts to secure a large quantity of pulp-wood from Quebec during the ensuing season as alluded to elsewhere.

In 1905 the State of New Hampshire used 70 per cent. of Quebec wood in the manufacture of its pulp—last year still more, and each succeeding year will show a greater ratio. Consider that the entire cut of spruce into lumber in 1905, in the four States named, converted into cords, was less than a million and a quarter cords. In other words, without the aid of Canada, the entire cut of spruce for all purposes in Maine, New Hampshire, Vermont, and New York for 1907 would not suffice to provide the necessary raw material for its pulp mills.

It does not take much calculation to estimate what an enormous impetus would be given to manufacturing in Quebec Province if this great resource of hers should be utilized within its own borders instead of being sent away for a foreign country to reap the benefit of.

BOOK AND PAPER EXPOSITION.

There will be held in Paris, France, from July 21st to November 1st, this year, an international exposition of books, paper, and allied industries.

Authorization for the exposition was granted by ministerial decree July 20, 1906. It will be held under the patronage of the Minister of Public Instruction and Fine Arts, the Minister of Commerce and Secretary of State for the Fine Arts, and the Under Secretary of State for the Department of Posts and Telegraphs.

The scope of the exposition is to be very broad, but it is roughly indicated by the following classification: Paper—Rag, pulp, and other basic products; pasteboard and cardboard; papier-mache; printed products; wall paper. Presses and processes of printing—Composing machines; type - casting. Binding-stiching; tooling; designs. Printing—From copper plate; from type, lithography. Photography — Cameras; plates; prints and supplies; half-tones; photogravures; postal cards. Publishers and booksellers—Maps and plans; music books; musical instruments; engraving; daily and periodical press; historical exhibits. Publicity — Posters; advertising; Governmental bureaus; education; social economy. Libraries—Furnishing; lighting; heating. Office furnishing—Desks and filing cases; letter paper; leather fittings. Optical instruments—Lenses.

A feature of the exhibition which should do much to make it of greater value to those who send exhibits is that a staff will be present who, for a certain fee, will make it their business to arrange for transportation, payment of customs dues, etc., and will explain each article exhibited and distribute literature pertaining thereto. Dr. W. H. Tolman, of 287 Fourth Avenue, New York City, is the Commissioner-General for America.

* * *

The article on "Wood Flour" in the April number of the "Pulp and Paper Magazine" has drawn forth a large share of attention from many parts of the Dominion and the United States. It is evident that the subject is one in which there is very considerable interest at the present time, and it seems altogether likely, as was remarked last month, that Canadians would speedily, if they would only go into the industry, create a demand from many parts of the world, as the raw material is becoming so increasingly scarce.

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Hon. Mr. Gibson brought up in the Dominion Senate last month the charge that there existed in Canada at the present time a combine in roofing paper. He stated that those in the combine had so manipulated as to have secured the admission of coal tar into this country free of duty, and that now they are able to tell the trade what they have to pay and where to go to get the different products. He stated his opinion that the only way to bring these people to task lay in abolishing the duty on tarred or roofing paper. Hon. Mr. Scott stated that this matter of combinations in restraint of trade was dealt with in the Criminal Code, but that the responsibility of enforcing the criminal law lay not with the Federal Government, but with the Provinces or with the individual. In the case of news paper, on which similar charges were made, the Government had stepped in and reduced the duty.

The erection of wharves at Portland, Me., by the International Paper Company, is part of the plans of that corporation to draw fresh supplies of pulp-wood from the gulf of St. Lawrence, first from around the Miramichi and then along Gaspe and further up the St. Lawrence. Another portion of this plan is to utilize the Quebec Central in the winter for drawing wood by rail when the St. Lawrence is closed. To this end the Rumford Falls road is now being connected with the Quebec Central and this connection will be complete by the time the Quebec bridge is finished. Thus, not only the International Paper Company, but the Burgess Sulphite Fibre Company and the Berlin Mills Company will tap the north as well as the south shore of the St. Lawrence for their supplies of pulp-wood; and thus "the good work" of depleting the forest reserves of Quebec goes on.

* * *

Considerable interest has been taken in an invention made by a Saxony manufacturer relating to the use of a kind of paper yarn in textile fabrics. According to the American representative at Plauen, the new paper cloth may revolutionize the garment-making industry and solve the dress problem that eternally confronts the man and woman of limited pocket-book. Just think of the cost of material for a full three-piece suit of clothes of ordinary weight being only $1. This is said to be made possible by Herr Claviez's invention, and a suit of clothes made from the new material will not be of sheets of paper sewn together, but a real fabric, woven just as cotton and linen cloth are woven, from a yarn made out of wood fibre. It is as tenacious and as pliable as ordinary cloth. Xylonite, the name of this new material, is not a sort of papier-machê, but primarily a yarn, and is described as a really excellent substitute for cotton, jute, linen, and even for silk.

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After a long term of waiting and much agitation on the part of far-sighted publicists, who saw the sure goal to which the old order of things was tending, the postal authorities have made some important changes in the rates on newspapers and other periodicals carried between this country and the United States, and also Great Britain. The postal rate on papers passing between Canada and the United States has been fixed at one cent for each four ounces, which is the same as the rate at which transient newspaper matter circulates within each country. This will make quite a difference to American newspaper and magazine publishers, but Canada's right to manage her own postal matters to suit herself is admitted. The postal rate on British journals sent to Canada is reduced to a penny a pound, the charges on packets not exceeding two ounces remaining at a halfpenny. This places Great Britain's magazines and other papers on a more equitable basis as compared with other countries.

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—The Lands, Forests, and Mines Department of the Ontario Government are taking extra precautions this year for the protection of forests from fire. Three instead of two parties will be placed along the Temiskaming & Northern Ontario Railway, which runs through considerable stretches of forest land. The number of rangers along the railway will be about eighty-one. The discovery of silver in the Temagami Forest Reserve and the consequent rush of prospectors has necessitated a considerable increase in the staff there, with a view to seeing that prospecting and mining are conducted in such a manner as not to endanger the pine timber. The official statement as to the appointment of the rangers concludes as follows:—"In addition to the rangers above appointed there will be a staff of probably 300 fire rangers on licensed berths. These rangers are nominated by the timber licensees and appointed by the department." There is no doubt that the building of the Temiskaming & Northern Ontario Railway through part of the Temagami Reserve has greatly increased the danger of fire, although one excellent precaution has been taken by the clearing of a wide strip of land on each side of the right of way. Within the last few years lumbering has been carried on to the very borders of the reserve, and the pulp companies holding concessions on the Sturgeon and Montreal Rivers, within the reserve, have been cutting for many years. Consequently there are considerable quantities of slashings and waste to add fuel to a forest fire once started.

PULP AND PAPER NEWS.

The Milton, N.B., new paper mill will soon be turning out news print and other paper.

The Peribonca Pulp Mill in the Lake St. John district of Quebec, has been burned down at a loss of $70,000.

The employees in the wood-room of the Riordon Paper Mill, Merritton, have received an increase of about 12 per cent. in their wages.

Patrick Judge, an employee in the Davy Pulp Mills, Thorold, for several years, has resigned to go on a prospecting tour in Cobalt region.

Wm. Dundas, an employee of the Riordon Paper Mill at Merritton, Ont., had his thumb cut off and four fingers crushed by getting caught in a callender.

The Northern Islands Pulpwood Co. have succeeded the Lake Superior Timber Co., and will put 250 men in the bush on their island properties this summer.

Pulp and Paper News—Continued.

About 15,000 cords of pulp-wood, the property of Atkinson & Demers, were torn from the booms at Etchemin, Que., early this month, the loss being very heavy.

The Battle Island Transportation Co., Limited, Montreal, has been incorporated. One of its objects is to buy and deal in pulp-wood and other wood products.

T. J. Stevenson, sales manager of the Riordan Paper Mills, Merritton, Ont., has left for Montreal, to which city the company has removed its head offices, having taken spacious accommodation in the Mark Fisher Building.

The company formed to reorganize the Royal Paper Mills Co. has applied to the East Angus, Que., council for exemption from taxes. A by-law will be submitted to the ratepayers of the municipality.

The Tonawanda Board and Paper Co., Tonawanda, N. Y., recently added to their equipment a 4 ton, 47-ft. span, Northern overhead traveling crane, manufactured by the Northern Engineering Works, Detroit, Mich.

Charles F. Dawson, Limited, Montreal, have been granted a charter as publishers, stationers, booksellers, printers, envelope manufacturers, etc. C. F. Dawson and H. J. Elliott, of Westmount, P.Q., are interested.

Thos. Morton, master mechanic of the Kinleith Paper Mill, St. Catharines, Ont., was presented by the employees of the mechanical department with a fine pipe and smoking set on the occasion of his leaving the mill.

Mr. Frank Ford, of St. Raymond, has left the paper manufacturing business and is now contracting to build paper and pulp mills and dams, etc. Being a thorough engineer, he is sure to make his way in this new departure.

The Rolland Paper Company have this month moved their Montreal offices and warehouse from St. Paul Street to the corner of St. Sulpice and Des Bresales Street. The new warehouse is larger and the offices are attractively finished.

The Cornwall Paper Manufacturing Company's mill at Mille Roches, Ont., is now under the management of Jas. L. McNicol, who has held some very important positions in paper mills in India and elsewhere. He succeeds Mr. Squire.

The Pacific Pulp and Power Co. has been granted by the British Columbia Government certificate showing its authority to proceed with its undertaking to supply water and water power for electric and hydraulic power for pulp and other mills.

Work on the new mills of the St. Raymond Paper Co. on the Ste. Anne River, Que., is now progressing more rapidly since the spring has opened. The machinery is now being installed, and it is expected that portions of the mill will be in operation within six weeks.

The Stetson, Cutler Co. have bought the steam tow "Help" at Liverpool, N.S., and will use her to tow pulpwood from Musquash to the pulp mill at Mispec and to the Partington mill at Union Point. The steamer is powerful and roomy, 104 feet long; cost, $12,000.

In the night of the 7th ult. one of the warehouses of the Montreal Paper Co. at Pont Rouge, Que., was burnt down to the ground; a total loss, covered by insurance. Of course, this being springtime, the warehouse did not contain much stock, only two carloads.

J. B. Sutherland, chief engineer of the Harmsworth interests in Newfoundland, has been with a party of twenty-six men exploring the interior of Newfoundland in the Victoria Lake region, including Bay Despair and the head waters of George the IV. Lakes. They explored two thousand square miles of timber lands.

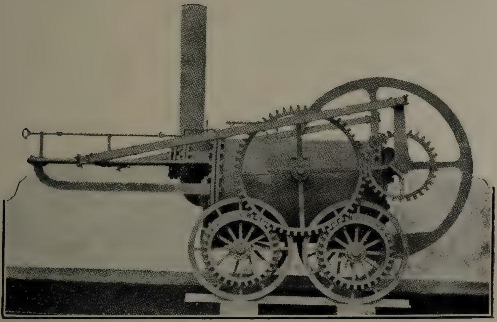
(Pulp and Paper News Continued on Page 116.)

BRITISH AND CANADIAN RAILWAYS.

(Correspondence of the Pulp and Paper Magazine.)

Manchester, April 22nd, 1907.

Ten years ago it could have been said that in two or three important particulars the passenger departments of Canadian and American railway systems were ahead of those of Great Britain. Your correspondent is bound to confess that to-day, in all the essential features that make for safe, regular and comfortable traffic British railways are distinctly superior to Canadian or American systems. I have travelled extensively, for example, on the London and North-Western Railway, which controls the Lancashire and Yorkshire Railway, and which traverses England from south to north into Scotland, and have marveled at the regularity of the principal trains, the care that is taken for the safety of the passengers and the flexibility of the system from the standpoint of the tourist or pleasure-seeker. At Euston station in London a writing room is provided where travellers may have their correspondence taken by stenographers, or have telegraphic and telephonic service at their disposal, or private rooms reserved for business interviews, with books of reference at their disposal, all for a very modest charge. Dining cars are on the principal fast trains, where meals can be got cheaper than on American railways, and the charges for sleeping cars are also less, and generally

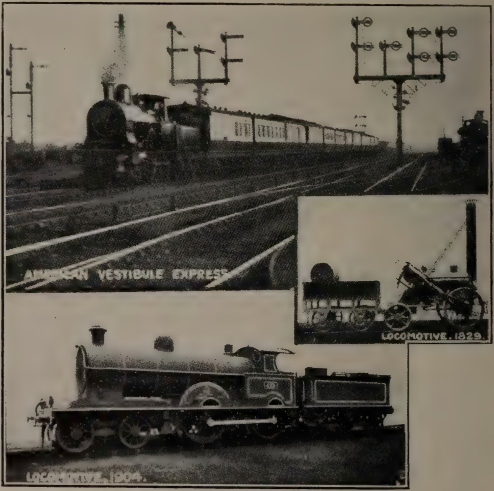


Trevithic's Engine, Built in 1803.

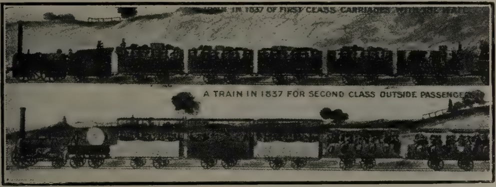
West Coast Corridor Express; Note Rail Chairs.

speaking the service better. The "West Coast" sleeping cars of the L and N. W. took the highest awards at the late St. Louis Exhibition. The main line fast trains of all British railways now have corridors and vestibules with lavatories, affording all the advantages of the American system, with the further advantage of dividing the coaches into compartments of different sizes.

In frequency and cheapness of excursion rates the British railways are in advance of American roads and not only is this the case, but a party of friends who wish to visit a place of interest may engage a coach (car) at very low rates. For example, the L. and N. W. allow return tickets at a fare and a quarter if six or more first-class tickets, or ten or more second or third-class tickets, are bought by one party; or in case of a party with fifty first-class or one hundred second or third-class tickets at a single fare for the round trip. Still greater advantages are given to school children and Sunday School children, so that cheap excursions are available on much easier terms than in America.



The highest tribute that can be paid to British railways is in the value they place upon human life and the care the directors take to this end, not only in building and equipping roads, but in maintaining them. The first thing that strikes a Canadian when he sets out on a railway journey in England is the substantial character of every bridge and culvert and viaduct, all of which are of stone, iron, concrete or brick. The British railway construction engineer does not attempt to climb a mountain, but goes through or around it, or builds a viaduct across a valley instead of plunging into its depths, wisely estimating that the annual saving in fuel and wear and tear of engines will more than pay interest on the extra cost. Apart from this, British engines outlast those of Canadian or American make, because they are constructed of more carefully selected material, and are better cared for while on the road. The majority of Canadian and United States engine drivers, where they are free to speak the truth, will tell you that their locomotives are being worked and racked to death and many a hideous wreck is due to the criminal policy of over-working the engines as well as the engineers. In Great Britain they do neither and the result is efficiency on the part of the train hands, and safety to passengers. In a recent year the London and North-Western Railway did not lose the life of a single passenger on their whole system. When the reader understands that on this system there are twenty express trains per day up and down between Manchester and London and that in its suburban lines about London there are as many as 123 trains per day carrying millions of passengers in the year; while on the Grand Trunk Railway there were 134 people killed and 7 injured, and on the Canadian Pacific Railway 192 killed and 54 injured in the year ending March, 1906, he will realize the contrast between the two countries. The total casualties in railways in Canada in 1906 were 382 killed and 222 injured, and the record of wrecks in the United States is a still bloodier one. The leading American roads are at last beginning to see that this enormous annual destruction of property apart from the criminal destruction of life and the evil reputation it gives their roads is a dear price to pay for the so-called economies, in labour and safety devices. It should not take Canadian railway managers so long to perceive that the block and automatic stop devices and a few extra employees are a very cheap insurance against collisions, seeing that 17 deaths and 24 cases of injury with accompanying personal damages and loss of rolling stock were due to collisions, a class of accidents which would be completely eliminated from the casualty lists if such improvements were adopted.


IN 1837 OF FIRST CLASS CARRIAGES
A TRAIN IN 1837 FOR SECOND CLASS OUTSIDE PASSENGE

NEW INDUSTRIAL ENTERPRISES.

The Gordon Pulp and Paper Company, Limited, has been granted a charter authorizing them to construct, build and operate pulp and paper mills and to engage in the manufacture and sale of pulp and paper or any production in which pulp or paper or any material used in the manufacture of pulp or paper may be used, with incidental and subsidiary powers. The following are the principal shareholders: S. G. M. Nesbitt, of Brighton, Ont.; M. W. Murdoff, of Trenton, Ont; M. L. Weber, and J. P. Luckhart, both of Elmira, N. Y., and A. I. McKinley, of Sarnia, Ont. The share capital of the company will be one million dollars, and the head office at Dryden, Ont. This company intends building a paper mill with a capacity of 40 tons of finished paper per day, and will also make their own sulphite and ground pulp. They will put up a two-machine mill and will run the first machine on manilas and boards. Construction work is to be begun shortly.

* * * *

S. Melville, an Eastern capitalist, proposes to establish a paper mill in Saskatoon, Sask., and is asking the Council for a suitable tract of land of three acres, and for tax exemption. Plenty of straw suitable for the cheaper grades of paper is obtainable right at hand, while at Prince Albert and further north there are large quantities of pulp-wood. If he can make proper arrangements, Mr. Melville expresses the intention of putting up a large mill and plant.

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The Albert E. Reed Company, London, Eng., who operate several large paper mills in England, are about to establish large pulp and paper mills in Newfoundland at a cost of $500,000. They have already purchased from the Newfoundland Paper and Pulp Co., the company of which H. M. Whitney, of Boston, Mass., is president. about 200 miles of forest limits in the Exploits Valley, Newfoundland. Geo. F. Hardy, 309 Broadway, New York, is the company's engineer in charge.

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The St. Simeon Lumber Co., Limited, recently incorporated under Dominion laws, with a capital of $290,000, proposes to build and operate pulp, paper and saw-mills. Among those interested are O. Brouillard, of Notre Dame du Bon Conseil, Que.; J. P. P. Robert, of Marieville, Que., and L. A. Gendron, of St. Hyacinthe, Que.

ELECTROLYTIC BLEACHING.

By L. J. Dorenfeldt.

(Read before the Society of Cellulose and Paper Chemists.)

Early in 1903 a lively discussion was conducted in the columns of the "Papier Zeitung between several advocates of the hypochlorite process and myself as sole defender of the purely electrolytic chlorine and soda process. Inasmuch as electrolytic bleaching has again been for several months the order of the day, may I again be permitted to break a lance on the side of the chlorine and soda process. I desire, however, to preface my remarks with the declaration that this time I desire to abjure from the beginning, without argument, the hypochlorite process in all cases where the consumption of chloride of lime is less than 700 tons per annum. Starting with this quantity, I maintain to-day the correctness of the passage of mine printed in "Papier Zeitung," in regard to an electrolytic process for the production of a bleaching fluid, that it can only enter into competition with a chlorine soda process where common salt, salt-brine, for instance, is dirt cheap, or where soda produced by electrolysis is of no greater value than burned lime. In this connection, I recall the circumstance, that the practical and close calculating Americans have recognised this fact for a number of years' and that for this reason no electrolytic bleaching fluid process has made headway with them, because the bleached paper pulp manufacturers in America, almost without exception, have a larger consumption of chloride of lime than 700 tons per annum. That the American paper pulp manufacturers have restricted their attention almost entirely to the soda process, while the Europeans, up to the present time, have bestowed their attention, almost as exclusively on the hypochlorite process, may also be attributed to chance and to the human tendency to imitate, is also probable.

At the time of my visit to the United States in 1888, Mr. George Warren Hammond, of the firm of S. D. Warren & Co., Forest Paper Mills, was conducting experiments with the Hermite magnesium hypochlorite process. These experiments failed there as they did everywhere, and the firm of S. D. Warren & Co. subsequently erected at their Cumberland Mills quite an important plant on the Carmichael chlor.-soda principle, with which they are still working and which, at the high prices asked for chloride of lime, is giving very satisfactory results. As the firm in question is very influential, their first failure with the hypochlorite process, as well as their subsequent success with a chlor.-soda process acted as a guide for their imitative American colleagues.

In Europe, however, the success of the Kellner cell in Hallein, and latter in Borregaard, gave a great impetus to the hypochlorite process, perhaps less on account of the advantages of the process in itself than on account of the exceptionally favorable conditions at Hallein, due to the exceedingly cheap salt and proportionately low-priced water power, and in Borregaard owing to the low price of power. The prices of chloride of lime remained for many years so high that these first hypochlorite plants have long since been wiped out, and with present prices of chloride of lime cannot again be profitably operated. In America it was the same. The chlor.-soda process was employed by S. D. Warren & Co., and as this firm was always well informed, a similar condition was recorded. In Europe Kellner-Partington always paid the high dividends, made the best goods and had the hypochlorite process, nothing but hypochlorite. The firm of S. D. Warren & Co. who, on account of the large percentage of salt, could allow their caustic soda to run to waste, were probably able to obtain good results with a hypochlorite process, while the Kellner-Partingtons, with a good chlor.-soda process, and a thorough exhaustion of the soda obtained, could probably work much cheaper than with their own hypochlorite process. That the electrolytic chlor.-soda process won such immediate favor in the United States is in large part due to the fact that the popular pulp mills there mainly use the soda process, and that they have only just taken serious hold of this process. They wished by means of electrolysis to replace, not only the chemicals used in bleaching, but those used in boiling. In Europe, however, where, outside perhaps of England, hardly any more soda cellulose is produced, they thought little or not at all of the soda itself, obtained through electrolysis, because, with the sulphite process of manufacture, anti-alkali ideas were unavoidable. Whereas in the United States, according to my knowledge, only one exclusively sulphite plant, the largest in the world, namely, that of the Burgess Sulphite Fibre Company, of Berlin Falls, practices the production of a portion of their bleaching material by electrolysis, and if the truth is known, according to a secret chlor.-soda process. There is in Europe only one cellulose making establishment working according to the sulphate of soda method, i.e., that of Billingsfors, in Sweden, that produces its bleaching material electrolytically and that by a hypochlorite process. The contrast between America and Europe in the development and in the employment of the electrolytic process is of the most pronounced character.

When, at the beginning of my possibly unduly protracted historical introduction, I undertook to exclude from the use of the hypochlorite process the entire field below an annual consumption of 700 tons of chloride of lime, this was by no means prompted by an underestimation of the hypochlorite electrolysis. On the contrary, I am of the opinion that it is just the small plants, in order to enable them to withstand the oppressive competition of the great producers, that should naturally turn their attention to the production of special qualities. With the help of the hypochlorite process, under otherwise favorable circumstances, an excellent field of activity is still open to them. With wholesale production, wherein to a certain extent there is no longer the effort to produce a good article at lowest cost, but rather the best goods at an increased cost of manufacture, the hypochlorite process, taking one consideration with another, appears to be too expensive to use.

For this reason Engineer Ahlin, formerly manager of the Swedish factory at Billingsfors, as a result of many years, labor in the works there, following the establishments at Hallein and Borregaard, the largest hypochlorite plant in the world, gives information to the effect that 1,000 kilogrammes of chloride of lime substitute (with only 3.35 per cent. of chlorine) would cost, with common salt at 1.50 marks and power at 50 marks per horse-power, and 300 working days, 79.42 marks. He has allowed for interest, depreciation and repairs only 15 per cent., calculated at 22.50 marks. Inasmuch as 15 per cent. can be deducted for interest and depreciation, a few marks should be added for repairs. In No. 33, 1902, Mr. Ahlin reckoned the cost of 1,000 kilogrammes of chloride of lime substitute at 103.25 marks, with salt at 2 marks per kilogramme, power at 75 marks per horse-power and 300 working days. The Schuckert process works out much cheaper.

For the Kellner process, Victor Engelhart, in his monograph, "Hypochlorite and Electrical Bleaching," page 168, in Table XXXI, quotes 1 kilogramme of effective chlorine, with salt at 1 pfennig per kilogramme, and the kilowatt hour costing 1 pfennig and closely calculated, favorable operating conditions, at 21.7 pfennigs. Power at 50 marks per horse-power in 300 days corresponds very closely with 1 pfennig per kilowatt hour. Reckoning 1.5 pfennig for the salt, instead of 1 pfennig, the proportion in the two processes will be exactly the same, and we find that the net cost, with the Kellner process, will be 82.80 marks per 1,000 kilogrammes of chloride of lime substitute, with 33.5 per cent. of chlorine. This includes an allowance of 10 per cent. for sinking fund, but nothing for interest. Calculating interest at 5 per cent., gives an addition of 7.79 marks, making the chloride of lime cost the cellulose factory, under these favorable conditions as to power, 90.79 marks per 1,000 kilogrammes. Inasmuch, however, as in Scandinavia 36 to 37 per cent. chloride of lime—of which according to Ahlin's repeated assertions, 335 kilogrammes equal 1,000 kilogrammes of hypochlorite chlorine in efficiency—can be purchased at prices ranging from 80 to 95 marks, there is certainly only small inducement for the erection of new hypochlorite plants. The old plants operated at the time of the old high prices of chloride of lime, can obtain 1,000 kilogrammes of chloride of lime, at the favorable prices quoted for power and salt, for 67-42 marks and under such conditions it is easy to see that hypochlorite bleaching will be ahead.

If, however, we reckon the kilowatt hour at 2 pfennigs, which would be exceedingly cheap power for German paper pulp factories, 1,000 kilogrammes of chloride of lime substitute, according to the figures given by Engelhart, would cost in a new Kellner plant 122.85 marks. According to the figures recently given by Ahlin in the "Wochenblatt fur Papier fabrikation," in which he quotes from 7 to 8.4 kilowatt hours and 5.5 kilogrammes of salt per kilogramme of hypochlorite chlorine, 1,000 kilogrammes of chloride of lime substitute, according to the Schuckert process, will cost, in round figures, 105 marks. This is really more favorable than the result figured out by Engelhart for the Kellner process, but the chloride of lime prices, which show a constantly lower tendency, offer an altogether superior attraction.

CARBON PAPER.

In reporting on Japan as a market for carbon paper, the United States Consul at Kobe remarks that only the best qualities of typewriter supplies are imported from England and America, and the market is practically limited to foreign firms. Osaka makes a cheap grade of carbon paper of three colors—black, blue, and purple—the selling price of which is as follows:—Per hundred sheets, 9½ by thirteen inches, 4s. 2d.; per thousand sheets, 37s. 6d. The quality is inferior as compared with the imported article. It is largely used in the post-office and other Government departments. The duty on the imported carbon paper is 10 per cent. ad valorem. No typewriter ribbons are manufactured in Japan, and only a small quantity is imported, mostly by the agents of typewriters for use on their machines.

QUEBEC WATER POWERS.

The Rev. Abbé Choquette recently gave an address before the Montreal Canadian Club on the subject of the "Reserve Energy of Quebec," which gave such an admirable idea of the water-powers of that province and their possibilities for economic development in the future, that we reproduce it at as great a length as possible.

In opening, Abbé Choquette remarked that progress was often the result of the utilization of unknown and neglected resources, some of which before being so subdued by science were really plagues. Force he defined as any cause that moved or tended to move any portion of matter. There were three great natural forces which possessed this capacity for performing work—fire, water and wind.

The first, fire, was not immediately available, but a latent force, which might spend its energies for years in the bosom of the earth, finally breaking out in volcanic eruptions; or it might lie for centuries calm and harmless in coal formations. Wind was a capricious, fugitive force, which they could best enjoy for the benefit of their health.

But from all time water had been utilized by man as the true natural power, and to-day in the form of electricity it was entering into powerful competition as "white coal" with its black rival. It was a question which would ultimately prevail.

Heretofore coal had been the most potent factor in industrial development, as those countries which had it not had to rely upon the good will of those who had it.

"In this respect," said the Abbé, "we in Quebec are deficient, and we feel it. We have no coal, and there is no possibility of ever getting it here, because our province, although of the New World, is too old. The only signs of coal in the province are small pieces brought down with the boulders in the glacial age."

Proceeding, Abbé Choquette humorously showed that the coal deposits of New Brunswick and Nova Scotia were formed of wood grown in Quebec and drifted down to those provinces, which were then under water. At that time Quebec, with its Adirondack Mountains, was the only spot on both the Americas where forests could grow.

This question of wood exportation is an old one. Hundreds of thousands of years ago, when there were no lumber kings and no export duties wood exportation from this province went on on an immense scale. The result is that now our prehistoric forests lie black and inert, carefully stratified, for the greatest benefit of our sister provinces, and have to be bought back by us.

But in compensation Providence, which dispensed its favors to good people, had given Quebec riches of water powers unequalled by any other country. She had mountains to furnish both rivers and current to furnish power, while the St. Lawrence, with its total fall of 178 feet between Cornwall and Montreal, was a vast storehouse of power, from which millions of horse-power could be secured.

All this power gave good values as compared with coal. The latter required 2½ pounds per hour per horse power, so that 1,000 horse-power would require 30 tons every 24 hours, and a million thirty thousand tons. That was the amount of energy dissipated every day by the St. Lawrence—and where was the colliery which could so easily and cleanly give such vast supply for all time?

The way to use this power was by the mastery of electricity, which had made such stupendous advances that one need be no prophet to foretell that ere long it would give life to all the organs of our mechanical activity.

As to the practical side, Abbé Choquette said that in Montreal steam power cost from $30 to $75 per horse-power per year for a ten-hour day. The

Shawinigan people delivered electric power to the Montreal Power Company at $14 to $15 per horse-power per year of 365 days of 24 hours each. The same power could not be generated by coal for less than $50, and he shrewdly suspected that the Shawinigan people were not actuated by charity, but got a profit on the transaction.

The great difficulty was the initial cost, that for a 20,000 horse-power plant being to-day $60 to $75 per horse-power, the cost being in inverse ratio to the size of the plant. Then some 25 per cent. loss occurred in transmission. Another big item of cost was the copper wire for transmission, but Abbé Choquette said that very promising experiments were being made with sodium, the metallic base of common salt, for this purpose, which could be produced for 10 cents a pound. In addition to mechanics, Abbé Choquette prophesied a vast field of work in electric smelters for copper, which might ultimately mean a great development of the low grade copper ores of this province.

In conclusion, Abbé Choquette warmly advised his hearers that Canadians should not allow the Americans to monopolize our water powers, because the control of national wealth and industrial life would inevitably lead to the mastery in political and in some degree of social life.

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UNITED STATES WOOD SUPPLY.

According to a circular (No. 97) just issued by the Forest Service of Department of Agriculture, Washington, written by R. S. Kellogg, forest inspector, the United States is using every year about four times as much wood as is supplied by increase of growth.

The lavish manner, he says, in which the United States has consumed the products of its forests and the rapidity with which the timber supply is melting away are wholly unappreciated by those who have never given the matter more than passing consideration. Familiar as all are with the use of wood for every purpose and in every industry, it is only when the various items are added that there begins to come a realization of the indispensable place the forests fill in the national economy.

The total quantity of wood cut was not less than 20,000,000,000 cubic feet. Of this, 3,000,000 cords were pulp-wood, valued at $15,000,000.

No less striking than the increase in output has been the shifting of the sources of supply, as one region has been cut out and another invaded. The North-eastern States reached their relative maximum in 1870 and the Lake States in 1890.

The shifting of the chief sources of supply has, of course, been accompanied by a change in the kinds of lumber produced. There was a time when white pine alone constituted one-half of the total quantity. In 1900 this species furnished but 21.5 per cent., and in 1904 only 15 per cent. of the lumber cut. On the other hand, Douglas fir is credited with 5 per cent. in 1900 and 13 per cent. in 1905.

The great demand made upon the forests naturally leads to the question: How much timber is now standing in the United States, and how long will it last at the present rate of cutting?

The original stand of white pine (including Norway pine) in the Lake States has been estimated at 350,000,000,000 feet, and this does not seem excessive when everything is considered. The total cut of pine in the Lake States since lumbering began there some seventy years ago has probably been not less than 250,000,000,000 feet, and there have also been huge losses by fire. The census estimate of the stand of white pine in 1880 was less than 88,000,000,000 feet; yet, according to the annual reports of the "American Lumberman," the cut since that date has exceeded 170,000,000,000, and the amount yet remaining was placed at 50,000,000,000 by the census in 1900 and at 60,000,000,000 feet by Long in 1903. The estimate in 1880 for Minnesota was especially low, only 817,000,000 ft. More than four times that quantity has since been taken out, and Minnesota is to-day furnishing over one-third of the white pine cut of the United States.

It is well known that the days of white pine are rapidly passing, and, even accepting the most sanguine estimates of the present stumpage, it will in a few years cease to be a large factor in the timber supply of the United States.

The stumpage of Eastern spruce was estimated at something over 12,000,000 feet by the census of 1880 and at 50,000,000,000 by the census of 1900, the total cut during the period perhaps approximating 30,000,000,000 feet. Our ignorance of the actual stand of spruce is further shown by the fact that Long's estimate in 1903 was 18,000,000,000 feet, while that of the "American Lumberman" a year and a half later was 75,000,000,000 feet.

Only one-fifth of the forest area of the United States is in national or State forests; four-fifths is either in private hands or likely to pass into private hands. It has been shown that the present annual cut of forest products requires at least 20,000,000,000 cubic feet of wood. To produce this quantity of wood without impairing the capital stock, the seven hundred million acres of forest must make an annual increment of 30 cubic feet per acre. Under present conditions of mismanagement and neglect it is safe to say that the average annual increment is less than 10 cubic feet per acre for the entire area. This means that each year's cut at the present rate takes the growth of more than three years. The average age of the trees which are being felled for lumber this year is not less than 150 years.

The forest area of the United States is sufficient, if rightly managed, to produce timber enough to supply every legitimate need. There is no reason why it should not some day be brought up to the point of yielding an annual increment of more than 30 cubic feet per acre, which, as previously said, would supply the quantity of timber now consumed, and which if used economically will be sufficient for a much increased population. The experience of Germany well illustrates the possibilities along this line. The following quotations from an article by Dr. B. E. Fernow, in "Forestry and Irrigation" for February, 1907, present the case clearly:—

"One hundred and fifty years ago Germany found herself in very much the same condition as regards her forest resources as we are to-day in the United States—all accessible portions more or less culled, or in poor coppice, burnt over, and damaged by cattle, the valuable virgin timber mostly confined to distant and inaccessible locations. Sporadic attempts existed here and there at protection, at regulation of the cut, at conservative lumbering, and still more sporadic attempts at reforestation.

. . . . . .

"Yet until the beginning of the nineteenth century reduction of supplies without adequate reproduction proceeded, and around the year 1800 the wood famine had become acute, giving rise to the same kind of agitation and literature which we have experienced, even to bringing in the catalpa and other such small, rapid growers as the saviors of the nation."

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—The United States imported paper and manufactures of paper last year from the United Kingdom to the extent of $114,695 worth in March last, as against $101,514 worth in March, 1906. These imports from the United Kingdom likewise showed an increase during the nine months' period from $724.497 in 1906 to $864.894 in 1907.

BANANA FIBRE.

Interest is again being taken in the utilization of banana fibre for paper-making, and a few data on the subject may, therefore, be of interest, especially in view of possibly closer trade relations between Canada and the West Indies, where banana culture is rapidly extending. The quantity of raw material to be had is considerable. The branches carrying fruit are used after cutting off the fruits. The branches are cut into 6-8 c.m. lengths and treated three hours in a boiler at 3½ atmospheres. They are then pressed to remove coloring matters, etc. Both acid and alkaline treatments in pressure boilers gave a useful fibre, but the acid treatment is to be preferred, as it attacks the fibres to a lesser extent. Six hours' boiling with 6 per cent. caustic soda (3½ per cent. Na_2O) at 3½ atmospheres suffices, but the liquid in boiler must be kept in motion. The fibre thoroughly washed and bleached as usual gave 67 per cent. yield on the raw material.

A paper 28 grammes to square metre was water and fat resistant, and responded well to the blister test. The following shows the tensile strength:—

Breaking length—	Machine direc..	8,400
	Cross " ..	6,900
		P.c.
Stretch	Machine direc..	4.7
	Cross " ..	4.2

Number of double folds in Schopper's machine under a tension 1.1 kg.—13,600. The fibre is colored blue-violet with zinc chloride.

There are two types of fibres—one thick, with rounded ends, showing a spiral-shaped canal; the other, very thin, translucent. These latter adhere together when the pulp is converted into paper.

The paper can be beaten without yielding the slimy conditions of fibre, and possesses parchment properties.

In the catalogue of contributions from British Guiana to the Paris Exhibition the following remarks were made in regard to the prospects of a plaintain-fibre industry in that colony: "This fibre of thousands of acres of plaintains is lost annually in this colony from the want of a simple and inexpensive machine for separating it. The tree must always be cut down to obtain the fruit, and the stem containing the fibre is allowed to rot on the ground. Could an efficient and cheap machine be invented, the fibre would be almost entirely profit to the planter. The banana yields less fibre than the plaintain tree, and its fibre is generally tinted. Owing to the increasing cultivation of bananas in the West Indies, and the fact that when once the stems have borne fruit they are cut down and allowed simply to rot on the ground, some plan might be devised for turning the fibres to account. There are at least 50,000,000 banana stems cut down every year in the West Indies, and at present little or no use is made of the fibre. It is evidently not sufficiently good to compete with first-class rope fibres, but it might possibly be used for making coarse paper, as a packing material, or in the manufacture of papier-mache.

The fibrous basis of the stems is ultimate fibres of fair length (2-3 mm.), of which the paper-making properties are well established; they are, moreover, easy of isolation. The specimen of "musa stock" exhibited in the Jamaica Court yielded on analysis 27 per cent. of cellulose. By long boiling in weak alkali, then bruising and washing to remove cellular matter, and bleaching in hypochlorite, i.e., a paper-makers' treatment, was obtained from the raw material 31 per cent. of a well-bleached, clean, tough fibre, a most useful basis for strong wrapping papers. On the other hand, so low a yield must be regarded as prohibitory. Of course, it would be possible to concentrate the substance in removing the cellular matter by a simple treatment such as that above described; and it is needless to say that a raw material yielding on treatment 50 to 60 per cent. of such fibre would command a fair price in European markets. The commercial issue entirely depends upon the cost of putting down the treated material, at the several ports, in such a condition that under the further treatment necessary for its conversion into a paper pulp the loss shall not exceed, say, 40 per cent. The value of such a raw material would be about £8 a ton.

After the work on behalf of the Indian and Colonial Exhibition was finished and about the time that Clayton Beadle had charge of boiling and bleaching some half ton of the banana, he made an analysis.

The fibre was not easily resolved. A pleasant sweet smell was noticed on boiling in soda. The fibre was much softened and the non-cellulose gelatinized. The fibre emitted a pleasant, sweet, woody smell on burning. The cellulose presented a beautiful snow-white appearance when bleached with permanganate and sulphurous acid, but shrivelled up on drying. The water leaf made on hand-mould showed the unprecedented shrinkage of 20 per cent. The paper was peculiarly transparent; in fact, as much so as tracing paper. Water leaf would bear ink as well as a good hand-sized paper. With this particular lot of fibre it was found quite impossible to pass it over the Fourdrinier; in fact, a large lot was beaten for the purpose, and we had to stop it on the machine and shut down. From the mould sheets were prepared rough, pressed, rolled and plate-glazed.

STOCKING MECHANICAL PULP.

Some European authorities are devoting themselves to the questions of stocking mechanical wood pulp and trying to find out the best methods of preserving it, which, under prevailing conditions, are becoming more important.

The addition of chemical preservatives to pulp intended to be stored has shown itself unreliable in effects, and too expensive from a financial point of view. In any case, they seem to preserve their efficacy for a short time only, and there can be no doubt that all of them are very prejudicial to the subsequent sizing of the paper.

The most certain method of preserving the pulp is simple drying. Once perfectly dry, the pulp will keep for almost any length of time, and the dry pulp also keeps its color if protected from actinic light; i.e., from exposure to daylight or the electric light, or, above all, to direct sunlight. It must also be kept from damp and dust. There is no need to have any special drying arrangement for pulp.

The great desideratum is rapid drying at not too great a heat; i.e., a plentiful supply of hot air to the drying-room. Direct heating of the drying-room should be absolutely prohibited, as in that case it is impossible in practice to have any security against overheating. If hot air is blown through the drying-room from a heater by a fan, both fan and heater being outside the room, it is perfectly easy to regulate the supply of heat. A thermometer is placed with its bulb in the pipe admitting the hot air to the drying-room, and is so placed that the scale can be read from outside. If, then, the temperature begins to get too great, the fan is slowed down, and if the heat is insufficient the fan is speeded up.

It must not be forgotten, however, that once pulp has been dried for keeping purposes it is not easy to bring it back again to pulp form. Every undissolved fragment will cause a mark in the finished paper.

It has already been stated that the dried pulp must be kept from light and dust. It may conveniently be kept on shelves in a dry, dark place. Being dry, it must be kept from moist air, as it is very hygroscopic, and hence the shelves must themselves not be hygroscopic. Shelves made of stone or cement are quite unsuitable, and there is no better shelf material than laths of well-seasoned wood, laid with narrow intervals between them, so that the air can circulate without the dried cellulose falling through.

A good deal depends upon the condition of the pulp before it is dried. If it has been made from rotten wood, or, if dirty water has been used in its manufacture, the pulp must be made perfectly dry for keeping purposes. The least trace of moisture will enable some of the putrefactive spores present to develop. If there is the least suspicion attaching to the origin or to the manufacture of the pulp, the drying should be continued until a sample, small enough to be weighed on a chemical balance, ceases to show any loss of weight.

As regards the store-room, care must be taken that the dried pulp is of easy access from all sides, so that careless workpeople shall have no excuse for allowing stuff to form a permanent layer constantly covered by fresh material. The shelves should be made quite empty when practicable, and spare shelves should be provided to receive old stock if it would otherwise be covered up by fresh stuff from the drying-room.

Yet another method of keeping pulp is in underground trenches, lined with matchboard or rendered in cement. In this case the pulp need not be dried, but it must be drained before being buried. Enough water should be left with it, however, to permit of it being pumped up into the factory from the underground channels when it is wanted. It is obvious that, independently of the fact that no drying is required, it is cheaper to dig and line these trenches than to put up an extensive series of shelves. Besides, the trenches have another and most important advantage over shelves, in that they take up no space that can be utilized for other purposes.

THE OTTAWA-HULL PAPER INDUSTRIES.

Both the Booth and Eddy mills on the Chaudiere have suffered from the scarcity of help, a condition which has been made worse by the opening of the season at Cobalt, which attracted a good many hands.

J. R. Booth has given a voluntary advance to his employees in all departments. Including the saw-mill hands they number over 2,000, and the advance makes wages now average $1.60 per day. He is now busy on the construction of the new sulphite and board mill, already referred to in these columns. Foundations for the new mill, which will be as large as the existing paper mill, are now being dug, and construction will be carried through as rapidly as possible. A complete plant for making sulphite pulp will be installed, as well as all the machinery for an up-to-date board mill. They are expected to be completed in a month or six weeks. The sulphite mill will meet the demand for fibre, which for some time past has been felt acutely. The building will be of cement and will cost $75,000.

The Ottawa River has been at high flood lately and has done considerable damage. At Eddy's pulp-mill a large quantity of pulp-wood burst the boom, drifted away and was only rescued with great difficulty. At the annual meeting of the company the other day, Mrs. Jenny G. H. Eddy, the widow of the lamented founder of the business, was elected to the directorate and W. H. Rowley was re-elected president. The reports presented showed that the company was making substantial progress in spite of the great loss sustained in the death of Mr. Eddy and the inconveniences caused by shortage of labor and scarcity of help. The financial report showed that the interest and sinking fund on $1,000,000 debentures had been fully met, and the usual stock dividend was declared. W. H. Rowley and G. H. Millen, joint managers of the company, announced a 10 per cent. increase in wages to the 1,700 employees.

IMPURITIES IN CELLULOSE.

It should be known to every paper analyser that the stuff sold under the name of cellulose contains more or less considerable parts of impurities, rosins, half disclosed and even entirely undissolved fibres. These unpleasant qualities of many sulphite productions form a connecting link between cellstuff and ground wood, whereby the differentiation is somewhat confused.

On the other hand appears the possibility to impart a certain treatment to the ground wood fibration, whereby the same will obtain all the characteristic microscopical appearances of the best grades of sulphite. This proposition may be news to many.

The solution of the problem exists solely in the intensity of the chemical treatment of the fibre, no matter whether the same has been mechanically beaten or crushed into fibres, or whether the same has been chemically disclosed. The **modus** alone of the mechanical treatment cannot determine the real issue.

A certain chemically acting factor playing a part of greater importance that is almost entirely overlooked exists in the action of water in the grinding process. But not the water alone, but also the amount and nature of the heat developed during the great pressure between wood and stone must also be duly estimated. This, too, is a chemical process, though so far of a harmless nature.

In this connection we observe the first stage of chemical action on the wood fibre, but the following "hot grinding" leads another step further, the operation being improved under higher pressure, resulting in increased heat in the water and fibres, thereby rendering the chemical treatment more intense. Thus, the second stage for perfecting pure cellstuff has been reached, a certain yet still rather primitive progress of insufficient consequence.

The next move begins to answer our desire, and although we are technically still in the wood grinding process, we find ourselves approaching our final object—"the cellulose," the brown wood stuff. In No. 24 of the "Papier Fabrikant" I have mentioned the accidental origin of brown wood pulp during a boiling trial for the purpose of finding means for facilitating the barking process, the result of which proved the following facts:

It appears certain that during steaming, but more so during boiling, the different constituents of wood, called incrustations, such as rosins, etherised oils, organic acids, tenifera, lignin matter, etc., are transformed in such a manner that we find besides brown coloring matter various soluble combinations that can be readily eliminated. The brown coloration should not mislead us to believe that carbonization of the fibre has ensued. Brown woodstuff contains to a larger extent than any other class of ground wood good cellstuff fibre, on the ground that the described extraction by steam of incrustations or lignin matter has created a supple, long-fibred tenacious material.

The results obtained in perfecting means for producing cellstuff in the described processes are mostly kept secret, and it is difficult to foresee the possible limits of improvements that can be perfected in this direction. We may expect to find it practicable to add useful substances to the boiling matter; a number of important experiments are under way in this interesting field of research.

Admitting that in accordance with my conclusions, the known ground woodstuffs are so nearly related to the cellstuffs we should be able to transform any class of woodstuff into cellstuff by proper treatment, otherwise the whole cellulose theory would appear quite problematical, we must find a way for improving the former imperfections of treatment, a practical test having fully confirmed the theoretical speculations, namely: I have elaborated a new process for transforming the so-called ground wood fibres entirely into cellstuffs, and the microscopical examination proved the same picture of perfection that can be represented by the best class of needlewood cellulose, contrary to any or all text books that have taught us the impracticability of improving the quality of ground wood owing to the presence therein of those undesirable incrustations. Why should we fear these incrusting weak substances? A trial has convinced me that they are unable to offer any serious obstruction to their elimination.

I have treated ordinary, though well-ground stuff, in a preparatory process, according to the method of my invention, without resorting to the mentioned amelioration, and have sent the half-stuff sample to a friend, a paper analyser, for an examination, requesting to learn the nature of the fibres. I received a prompt reply: "100 per cent. cellstuff (sulphite)."—W. Ebert in "Papier Fabrikant."

A FRENCH VIEW OF WOOD PULP.

A recent number of "Revue Scientifique" had an interesting article on wood pulp, from a French point of view. The excise tariff introduced in France in 1664 imposed an export duty of six livres per quintal on "vieux drapeaux, drilles et pattes." Now in the twentieth century the best papers are still rag papers and the numerous vegetable fibres which have been proposed for paper making will possibly replace cotton as paper material when they replace it as a textile. Almost every vegetable fibre has been suggested as a raw material for paper making, says our contemporary, and it gives a good summary of those which had been brought forward at that time, and gives foot-notes with respect to them which constitute an important bibliography for those interested in the subject. The only substitute for rags which has so far attained a safe position is pulp made from certain kinds of wood, which has, however, achieved such a success that there is hardly any question at present of any competition with it and even the best papers are made from various mixtures of wood pulp with rags, straw, or alfa. Most of the wood pulp comes from pine trees, but poplar and willow are also employed.

It is most important for the paper material manufacturer to use raw materials which give the best yield of pulp. The highest yield does not exceed 60 per cent., which is about the average for white woods, such as the best poplar, fir and pine, in the form of chemical pulp. The other sorts may be classified as follows:

	Per cent.
Ordinary pine or alfa pulp	50
Willow and horse chestnut	38
Oak and walnut	26 to 29
French wheat straw	41
Zealand wheat straw	40
Ipolden (Holland) straw	40.4
Oat straw	41
Rye straw	45
Barley straw	38
Grass	25

A cubic metre (35 cubic feet) of acacia bark gives 1 ton of paper fibre, and bamboo in its raw form yields 20 per cent. of its own weight. The mulberry tree has been found to yield paper fibre to the extent of about 50 per cent. of the weight of the bark.

As regards manufacture, the introduction of wood pulp revolutionised paper making, but it is curious that France was very late to adopt the new material. It was not until 1870 that the new raw material was adopted in France. There are, of course, two kinds of wood pulp—mechanical pulp and chemical pulp. The distinction consists in the method of preparation. The manufacture of mechanical pulp is merely a grinding process whereby the particles of wood are reduced to an extremely fine state of subdivision. The idea of using wood cellulose for paper manufacture is due to Keller, a German weaver, who sold his process in 1847 to a paper-maker named Voelter. Voelter made a fortune out of the process, and when the secret leaked out the method was adopted all over the world.

Mechanical pulp is brown in color, and is used either alone or is mixed with alfa, straw and other raw materials in various proportions, according to the use for which the paper is destined.

The history of the preparation of chemical pulp is not without interest. In 1857 Houghton patented the use of caustic soda for disintegrating wood following Mellier, who had already used that reagent on straw, and his method—viz., heating sawdust with the lye under pressure—is not yet disused.

The pioneer of the sulphite process was undoubtedly Dahl, who worked it out at Dantzig in 1889. The method is based upon the fact that, while vasculose is reacted upon at 100 deg. C. by bisulphite of sodium, cellulose is not affected. Thus the cellulose of the wood is purified from the paper-maker's point of view. The wood is first strained to open its pores and soften it. It is then heated under pressure in a solution of the bisulphite. A temperature of 100 deg. C. is maintained for seven or eight hours. After this treatment the wood is ground up in a special mill. The resulting pulp can be used as it leaves the mill, or may be bleached with chloride of lime, according to circumstances.

It is easy to see whether caustic soda or bisulphite has been used, when we know that the paper under examination has been made from wood pulp. If the paper has been prepared from bisulphite pulp it is transparent, hard, rather brittle, and shiny. If, on the other hand, the pulp was caustic soda pulp, the paper is opaque and supple and has a characteristic feel, unless rag-pulp has also entered into the composition of the paper.

SOO PAPER MILL BURNED.

On the 24th ult. there was a destructive fire at Pulp Mill No. 1 of the Sault Ste. Marie Pulp and Paper Co. It started about 3 a.m. in the screening-room from a hot journal, which ignited the oil. Instantly the mill was filled with smoke, and the night men rushed out, leaving the machinery running, which rumbled on until the burning floors let the heavy dryers fall into the water raceway below. Thirteen of these were badly damaged, besides twenty-four screens. The grinders, we understand, were not seriously injured. During the fire Benjamin Schuratz went on the roof to assist the firemen and was struck by one of the streams, knocking him off on another roof, which caused his death.

The ground wood machinery will be a total loss, but the walls have not been injured to any extent.

The loss is estimated at $100,000, almost fully covered by insurance, divided principally among the following companies:—

Montreal, Canada, London and Lancashire, Western, Hartford, Phœnix, Manitoba, German-American, Connecticut, and Queen City.

The fire would have been still more destructive had it not been for the steel roof, which prevented the conflagration spreading to other mills. About 250 men were thrown out of employment. The loss is a severe one, owing to the present state of the print branch and the increased shortage which will ensue.

Mr. J. H. Millington, the superintendent of the mill, in a recent letter, informed us that the fire had gutted the machine, screen, and barker rooms, but that the company were going to repair the mill and restore it to its former condition, using as much of the machinery as possible. The mill was making large earnings.

SAVING WASTE MATERIAL.

In facing the problem of the reclamation of filler, fibre and color from the backwater of paper machine, wet press or "decker," the paper mill owner or manager must give operating conditions their due importance when the time comes to decide upon a system of save-alls. The character of the material to be reclaimed, the amount of size generally carried by the paper, the amount of backwater to be handled by the system, whether or not the orders are large in quantity and vary greatly in color, and the abundance or lack of fresh water are all conditions which have an important bearing on the working of a system, and it is with regard to these conditions that it must be selected.

Save-alls, so called, may be divided into two classes—the gravity or settling save-alls and the various types of screen. The latter class may be also divided into two more, viz., those which revolve in a vat filled with the mixture to be separated, allowing the water to pass through the wire gauze or silk with which they are covered, and those screens which take the mixture into the interior and by rapidly revolving the apparatus project the water through the wire gauze by centrifugal force.

Considering first the screen, or mechanical save-all, it has been clearly demonstrated that the one referred to (i.e., which revolves in a vat of the mixture to be separated) is the best apparatus yet devised for effecting a separation of fibre and water, but when the mixture is impregnated with loaded material, as in the backwater of paper machines, it is found to be very ineffective. The clay or other filler forms a slimy coating upon the wire gauge or silk covering, and effectually prevents any water from passing through the meshes, and after being operated a short time it becomes useless. In fibre mills these save-alls are of the greatest value, however, and properly installed will pay for themselves many times over. To them may be piped the waste water from the wash tanks, blow pits, and drainers, the bleach wash water and the backwater from wet presses and deckers, and so great is their efficiency that no appreciable amount of fibre can possibly get away. If the backwater carries very much bleach in solution some difficulty will be experienced by the corrosion of the wire gauze, but this can be met by washing it occasionally in dilute acid.

The second type of the mechanical save-all is usually made in the form of a cone, resting on its apex, having for its peripheral surface a screen of either wire gauze or perforated metal. The apparatus being revolved at a high rate of speed, the mixture to be separated is led into the cone at the top and the water is sprayed through the holes in the screening surface by centrifugal force. The pulp left behind is drawn out through the apex, and a shower pipe is arranged so as to play against the outside surface and prevent the screen from plugging. The perforations range from one-sixty-fourth to one-sixteenth inch in diameter, and retain the stock well when used in sulphite mills, but a shorter fibre will be sprayed out along with the water—reducing the size of the perforations only curtails the output and makes them plug more easily. They can only be used on an unloaded, unsized fibre.

On the other hand, the gravity or settling save-alls are valueless on an unloaded fibre, the low specific gravity of cellulose tending to keep it in suspension, but when conditions are favorable they are capable of excellent service. Having no moving parts, they cost nothing for repairs, driving power or supervision, all of which figure in the operation of the centrifugal screen. They range in form and cost from the intricate series apparatus used in Germany to the simple wooden tank found in many modern mills. Properly installed, the latter form will render much more effective service than the patented reservoirs poorly arranged.

In designing any save-all system one of the cardinal principles is to send no material to save-all which can be reclaimed in any other way, and this applies particularly to the gravity variety. By stirring a little lightly loaded stuff into a beaker of water and allowing the mixture to come to rest it can easily be seen that an appreciable time is required to completely settle out all of the fibre, and if the mixture is even slightly agitated it is almost impossible to obtain a compact precipitate. A large amount of backwater passing to the save-all will have the effect of keeping its contents in constant motion, and the currents thus set up will seriously impede its action. It is known that a current travelling at the rate of 10 feet per minute will hold in suspension six times as much solid matter as one moving only 5 feet per minute, and this explains why it is necessary to keep the save-all well within its rated capacity.

One of the most common mistakes found in save-all installations in paper mills is the poor arrangement of the machine pit. Too often this is simply a rectangular box under the wet end of the machine extending from under the breast roll clear back to the first drier drum, and intended to catch all of the backwater coming away from the machine. This arrangement is very wasteful and the cause of endless annoyance. When changing a felt or washing one on the machine any dirt or slime from the frame or felt will drop into the pit, and unless its contents are sluiced on such occasions will eventually show in the sheet. If for any cause the paper breaks at the wire, all of the broken so made must pass to the save-all and be partially reclaimed when in reality it is in perfect shape to go direct to the beater chest. When washing a felt, changing a color or putting on a wire the contents of the pit must be washed into the sewer, and in mills making small orders of varied color the loss from this source is large. The proper method is to divide up the pit into three compartments by means of transverse walls, one pit under the wire from breast roll to suction boxes, one under the coucher to catch the wire broke, and the third under the presses. Only the last named is connected with the sewer, but each of the dividing walls has a gate at the bottom, which, when opened, allows the entire pit to be washed into the river. The contents of the first pit—under the wire—should go, with the water from the suction pumps and press rolls, to the save-all apparatus to be separated. Connected to the second pit—under the couch rolls—there should be a plunger pump of small capacity to throw its contents to the beater chest if the latter is above the level of the machine-room floor, but if the chests are in the machine-room basement a suitable pipe may be provided to carry the stuff to them. Enough water will come into this pit from the first spray pipe to bring the stuff to the right consistency, and if the chests are sufficiently large no change in the weight of the sheet will follow the emptying of this pit. The pit under the presses should be piped direct to the sewer, as no salvable matter will be found there.

This system of pits will prove of greatest value in mills running on small orders with frequent changes of color, as it greatly facilitates changing from one color to another. While there is still half a chest of stock to run off, the machine tender should pull the valve on the coucher pit and empty it, so that when the stock is run out of the chest all that will be wasted is the low percentage mixture in the wire pit and the save-all.

In mills so situated that an abundance of fresh water is not available, or where river pollution is to be avoided, the save-all system is an absolute necessity, although the constant "turning over" of the water for days and weeks is apt to cause excessive foam. The water becomes heated by its frequent visits to the machine, and in making hard-sized papers—particularly yellow colors—the foam is apt to show in the sheet, but this may be remedied by occasionally emptying a beater with fresh water. A good, finely-divided shower on the slice and another on the head-box will aid materially in keeping it down, and, although some claim that this causes the foam to sink and work under the sluices, such is not the case if a deep enough pond is carried. Much of the foam made is due to unnecessary churning of the water in fan pumps, and whenever possible a plunger pump should be used to throw the water from pit to save-all. A well-made flow box with two baffles should be introduced between pump and save-all with a spray pipe attached, and any foam coming up with the water will be "trapped" therein. An inclined plane or trough should be fastened along the inside surface of the save-all, by means of which the water may reach the level of that in the apparatus with a minimum of agitation.—Paper Trade Review.

PULP AND PAPER NEWS—Continued from Page 98.

The Riordon Paper Co. recently installed a new pulp-dryer at their Hawkesbury mill. It was manufactured by the Black-Clawson Co., of Hamilton, O.

The Davy Pulp Mill, Thorold, has been thoroughly overhauled and new machines added, doubling its capacity. When tested recently, the new machines acted perfectly. The new machinery includes a pair of 35-inch water-wheels made by the Wm. Hamilton Manufacturing Co., Peterboro'; another grinder; a third wet machine; also some new screens.

An extraordinary state of things developed at Buckingham, Que., in connection with the trial for manslaughter of the Buckingham strikers. Their counsel filed an objection on the ground that the necessary stamps on the seals had been overlooked in the issue of warrants for their arrest, and they were at once freed. An appeal will be made.

The Canadian Northern Railway, which recently acquired control of the Quebec and Lake St. John Railway, expects to open the La Tuque branch in June, to connect with the National Transcontinental. There are great quantities of pulp-wood in that region, and the opening of the road should be a great advantage in opening up its resources in that respect.

The Ontario Government will return to the Montreal River Pulp and Paper Company the $20,000 which the company forfeited at the time of the cancellation of the pulp-wood lease. There was some discussion on the subject in Parliament, Hon. J. P. Graham declaring that the old Government had made the conditions too onerous for the company to carry out.

Mrs. J. B. Stuart, wife of a former president of the Maritime Sulphite Co., of Chatham, N.B., who was also president of the Bank of Hamilton, has brought suit to recover $200,000 in securities which she had advanced to the bank to secure claims of the company. Her attorneys claim these securities were obtained by undue influence, and that notes signed by a woman at the instance of her husband are void.

Edwin Crabtree & Sons, manufacturers of wrapping and sheathing papers, with mills at Crabtree Mills, Que., and at Well's River, Vermont, have removed their Montreal warehouse from St. Peter Street to 82 Youville Square. Both mills are running to full capacity, and the firm reports increasing business in home and foreign trade. The present capacity of the plant at Crabtree Mills is twenty tons per day.

(Continued on Page 118.)

EMERSON MFG. CO.

Jordan Engines

Beating Engines

Bed Plates

Engine Bars

Avenues of Our Success.

EMERSON

All Work Guaranteed.

Press Rolls

Wet Machines

Cylinder Machines

Cylinder Washers

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Stuff Chests

Centrifugal Pumps
Stuff Pumps

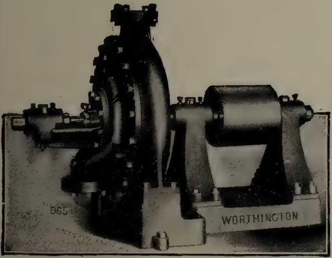
Filling for all styles of Jordans

LAWRENCE, = = = MASS. F

The John McDougall Caledonian Iron Works Co.

LIMITED

MONTREAL, P.Q.



Worthington Turbine Fire Pump, working pressure 160 lbs.

BOILERS:

Return Tubular "McDougall"
Water Tube, etc.

TANKS:

Water Tanks, Penstocks, Steel Riveted Pipe.

Hydraulic Presses:

For Pulp and Paper Mills.

Builders in Canada for "WORTHINGTON" TURBINE PUMPS, CONDENSERS, Etc. and New York Filter Co's. Pressure Filters.

Pulp and Paper News—Continued.

A correspondent at St. Basile, Que., who signs himself "Laurentide," informs us that the mills in the Portneuf, Que., district are now running at their full capacity, as the water is now in good quantity in the rivers. Big quantities of wood have been made this winter, and with the melting of snow in the Laurentide mountains it is pretty sure that all this wood will come out without any trouble being sustained on account of low water this year.

A special meeting of the shareholders of the Imperial Paper Mills of Canada, Limited, was held in Toronto on the 15th ult., and resolutions passed confirming By-law 58, passed recently in London, authorizing the directors to create an issue of mortgage debentures amounting to £400,000, and to secure the same by a charge on the company's property and assets. At the London meeting a resolution also passed consenting to interest on coupon bonds remaining unpaid until July 1, 1909.

The Canadian Boomer & Boschert Press Co., with main offices and works at 1040 St. Catherine Street East, Montreal, is now prepared to supply the pulp, paper, and veneer mills of Canada with high-class special knuckle-joint, power screw, and hydraulic presses. The officers of the Canadian company are R. E. Boschert, president; George E. Boschert, treasurer; A. E. G. Madney, secretary. Their announcement appears regularly in the "Pulp and Paper Magazine." Catalogues and price lists will be gladly furnished.

In the case of Price and the Chicoutimi Pulp Co., involving certain water rights, judgment has been reserved. The respondent wanted possession of a water-power site on the Chicoutimi River, $2,000 damages and an injunction to restrain the company fouling and obstructing his head-race by throwing bark, sawdust and other refuse into the river at its mills further up stream. The judgment appealed from affirmed the decision of the Superior Court at Chicoutimi in favor of the plaintiff as to the possessory conclusions and injunction, and reserving the question as to damages.

W. M. Wallace, general manager, and Gordon Wallace, assistant manager, of the Carron Grove Paper Company, Denny, Scotland, paid a flying visit this month to some of the paper mills in Canada and the United States and left for home by the Cunard Line on the 21st. They visited the Eddy mills and the new Booth mills at Ottawa, and expressed pleasure with the substantial and modern character of those plants. Mr. Wallace was greatly impressed with the vast possibilities of Canada as a pulp and paper producing country. When it came to the production of the finer grades of paper made from other material than wood pulp—of which his own mill is a good old country type—Mr. Wallace was not so sure that American practice as exemplified in the mills he saw, was ahead of British practice. In America everything appears to be secondary to the question of speed in the running of machines, and he seems to be of one mind with other British paper-makers, who think that quality is sacrificed in the effort to get the greatest production. The Carron Grove mills are chiefly devoted to bond and ledger papers of the better class.

⁂

—There has been a continued increase in the volume of export of rags and waste from Canada to the United States.

GROUND WOOD
SULPHITE
PULP WOOD

G. A. HOWELL,
1305 Traders Bank Bldg.
TORONTO, Canada.

OLIN SCOTT, M.E.,

BENNINGTON, VT., U.S.A.

Manufacturer of best up-to-date

PULP MILL MACHINERY

including the

NEW ENGLAND WOOD PULP GRINDER,
SCREENS, WET MACHINES,
SAWING MACHINES, BARKERS,
SPLITTERS and CONVEYORS.

Can furnish plans for mills, also furnish complete outfit of machinery including shafting and gearing, and can name price for the complete outfit for a mill, with full guaranty for the production of the mill and the integrity of the machinery, and give ample opportunity to test the machinery under the guaranty before paid for.

The 1906 pattern of pulp grinder was sold last year to make 6 tons daily of fine pulp, and when tested under the warranty made considerably more. The pulp machinery made at this establishment includes about 600 pulp grinders used in 143 mills scattered through the United States, with 21 mills in Canada and Newfoundland, also in Mexico, Japan, Sweden, Norway, Germany, and one mill for the Emperor of Russia, and can furnish machinery at reasonable prices. Have machines on hand for prompt delivery.

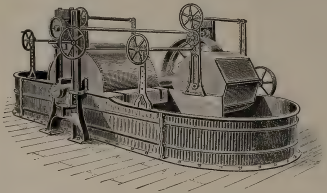
Can give liberal terms of payment to responsible parties.

No charge for specifications and reliable estimates for cost of mills.

HOLYOKE MACHINE COMPANY

HOLYOKE, MASS., U.S.A.

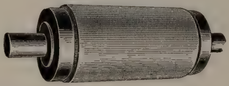
MANUFACTURERS OF



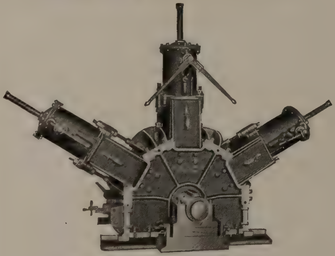
Washing and Beating Engines with Patent Double Hoist and Tubs of either wood or iron.

Hydraulic Pumps and Presses.

Rag Cutters and Rag Dusters.



Cotton and Paper Rolls with Patent Fastenings.



Patent Improved Wood Pulp Grinder.

Elevators, Rotary Fire Pumps and Friction Gearing.

Gears Accurately Spaced and Planed.

Shafting, Pulleys and Mill Work.

Machinery for Wood Pulp and Paper Mills.

Vertical and Horizontal Water Wheels with Flumes and all connections.

Wood Barkers, Wood Chippers and Wet Machines.

Newest Designs

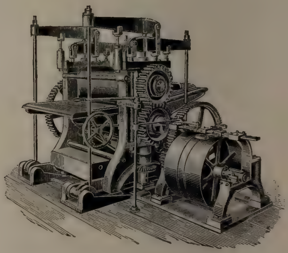
AND

Highest Efficiency

Calenders. All kinds of Super-Calenders, Friction Calenders and Platers.

Chilled Iron Rolls.

Special Machinery.

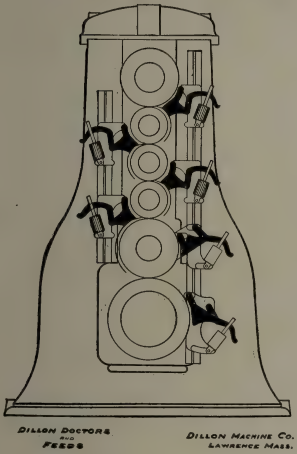


Description and Estimates Furnished; also Gear List and Catalogs sent on application.

DILLON MACHINE CO.

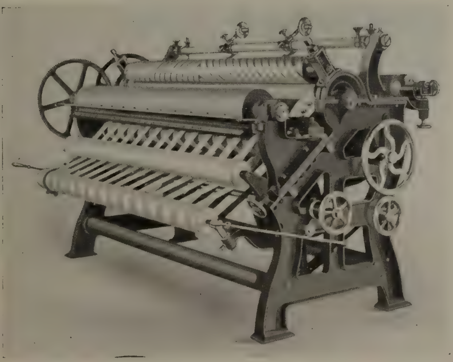
BUILDERS OF

PAPER MILL MACHINERY



- **Beating Engines**
- **Washing Engines**
- **Jordan's Three Sizes— Single, Double & Triple**
- **Stuff Pumps, with Dillon Patent Valve Seating**
- **Wet Machines**
- **Horizontal and Vertical Stuff Chests**
- **Single and Double Paper Cutters**
- **Backstands**
- **Plates, Knives and Bars**

**DILLON
PATENT
DOCTORS
AND FEEDS
MADE IN
CANADA
BY THE
SHERBROOKE
IRON WORKS,
SHERBROOKE, P.Q.**



LAWRENCE, MASS., U.S.A

THE MARKETS.

May 17. 1907.

Pulp continues scarce, and with the backward spring in Ontario and low water to bring down logs, the situation is aggravated. Insufficiency of water at some of the mills during the winter has left stocks of pulp very scanty. Conditions are more satisfactory in the East. Prices continue exceedingly firm at $25 for ground wood and $50 for sulphite. The burning of the Soo mills has made the shortage worse.

The paper market is strong. Wrappings are scarce and acutely wanted, and news and board are in practically the same position. Increasing prices are the record in many instances owing to the extra keen demand and the increased cost of labor and material.

British.—The market for both mechanical and chemical pulp is very firm. In the latter, some manufacturers offer £2 10s. for good grades of moist. The esparto market is steady and prices are firm.

Chemicals, reports the "World's Trade Review," are in steady demand. Bleaching powder (soft wood) is quoted £4 12s. 6d. to £4 15s.; caustic soda, 76-77 per cent., £10 10s.; ammonia alkali, 58 per cent., £4 10s. to £5 15s.; soda crystals, £3 2s. 6d.; salt cake, £2; and recovered sulphur, £5.

TRADE ENQUIRIES.

The following enquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these enquiries, with their addresses, can be obtained upon application to Superintendent of Commercial Agencies, Department of Trade and Commerce, Ottawa, or to the "Pulp and Paper Magazine," Toronto.

Wood Pulp—425—A Belgium firm having a close connection with the leading consumers in France and Belgium is prepared to take up the sale of Canadian wood pulp, and would be glad to have the agency of a first-class manufacturer, the quality of whose product will suit the markets mentioned.

Wall Paper—468—A large British wall paper manufacturing concern invites enquiries from Canadian purchasers of the cheaper and middle class varieties of wall paper.

Asbestos Fibre and Paper—498—A London firm of merchants wishes to correspond with Canadian producers of asbestos fibre and paper seeking representation in England.

THE GERMAN PAPER INDUSTRY.

Considerable injury has been done to the paper industry in Germany as a result it is said of the new protective tariff, and several firms have already removed their work to Austria, whilst others are contemplating doing so with the least delay. The total value of the annual output of paper in Germany is £22,500,000, of which over £13,000,000 is exported, the latter figure including books and printed matter, which works out to over 6 per cent. of the entire output. German exports are controlled by syndicates, whose policy is to keep the home prices high and supply foreign consumers with paper at a price often below the actual cost of production. A striking example of this is supplied by Dr. Hager. The German Paper Syndicate quoted in London news paper at 1d. per pound, which is equal to the German price at 15 pfennigs per kilo (2½ lb.), while in Germany the price for the same material was 22 pfennigs per kilo. In this manner the German consumer had to pay more than the full difference of the export duty, amounting to 6s. per 220 lb.

PULP and PAPER Agency

A responsible firm located in the Manchester district is open for proposals to represent a Canadian Pulp Mill and a Canadian Paper Mill in the British Market.

Address—"MANCHESTER"
c/o Pulp and Paper Magazine,
Confederation Life B'ld'g., Toronto.

THE **Swenson**

EVAPORATOR

Boils off Water, not Spent Caustic.
Is easily kept clean.
Seldom repaired, and then with ease.
Works most Rapidly and Efficiently.

American Foundry & Machinery Co.

(Formerly WALBURN-SWENSON CO.)

Works: CHICAGO HEIGHTS. 944 Monadnock, CHICAGO

Pulp and Paper Handbook of Canada

This Directory will give full information regarding the pulp and paper mills of Canada, the officers, managers, superintendents, capacity, power used, particulars of machinery, kind of power used, products of each mill, and selling agents, if any. Also all the available information to the time of going to press of new mills projected; paper box factories, paper bag manufacturers, wholesale paper dealers, jobbers, bookbinders, etc.

THE REVISED CANADIAN TARIFF as it affects the pulpwood, pulp and paper industries, pulp and paper machinery and mill supplies will also be given; also the tariffs of the U.S. and Newfoundland.

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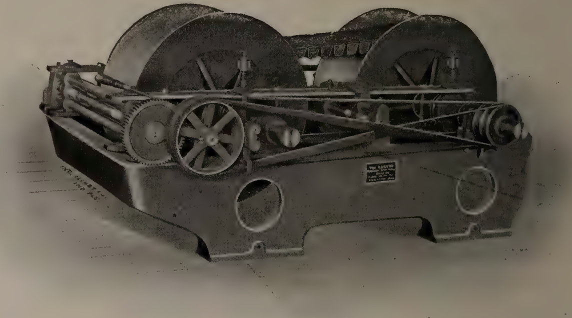

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"THE REEVES"

Variable Speed Transmission

The one practical device for regulating the speed of the paper machine.

It everlastingly gets away from the nerve racking old true cone, in whatever form it seeks to disguise itself.

There is absolutely no shifting of belt.

It is made in sizes to drive anything from a winder to a 140″ Fourdrinier.

Any speed within its extreme range of variation may be instantly secured and the changes effected without breaking or stopping the paper sheet.

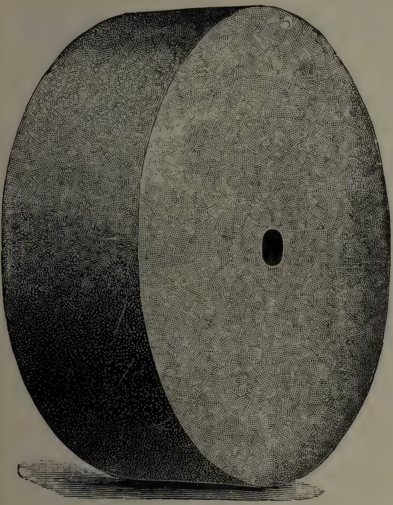
Recommended and adopted by the largest and most progressive paper mills in America and Europe.

Send for Paper Machinery Catalogue To-day

REEVES PULLEY COMPANY,

COLUMBUS, INDIANA, U.S.A.

German Grindstones



Wood Grindstones,

Wood Pulp Refiner Stones,

Edge-Runners

French Millstones

Artificial Emery and Quartzstones

Stones of all kinds used in Wood Pulp and Paper Manufactories.

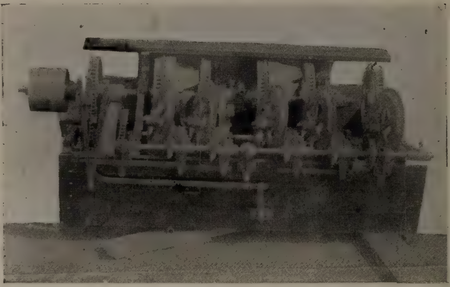
Six Own Quarries at
Wehlen-Zeichen and Langenhennersdorf (Saxony)
Neuland and Goldbach (Silesia) Hoffnung (Bohemia).

GEBRÜDER ISRAEL

PIRNA-ON-THE-ELBE (SAXONY)

Oldest Factory for Wood Grindstones in Germany. Established 1866.

THE MOREAU PULPWOOD and LOG BARKER



Built expressly to peel pulpwood.

Capacity, 3 Cords per hour with 2 men and 6 horse power.

It will save the bark which can be used for other purposes.

Peels wood of all dimensions, 3 inches up and of all lengths from 36 inches up.

The most desirable certificates and full particulars on application to

The Moreau Barking Machine Co., Ltd.

C. MANSEAU, Selling Agent for U.S. and Canada, Drummondville, P.Q.

RELIABLE AGENTS WANTED.

PULP STONES

ENGLISH, GERMAN and SCANDINAVIAN

ALSO THE

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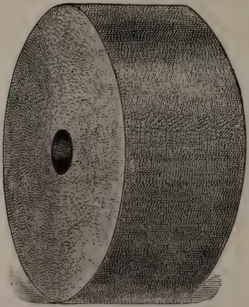
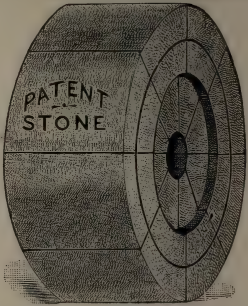




the construction of which gives to it advantages not found in the one piece stone.

Let us tell you about them

JEAN FREESE

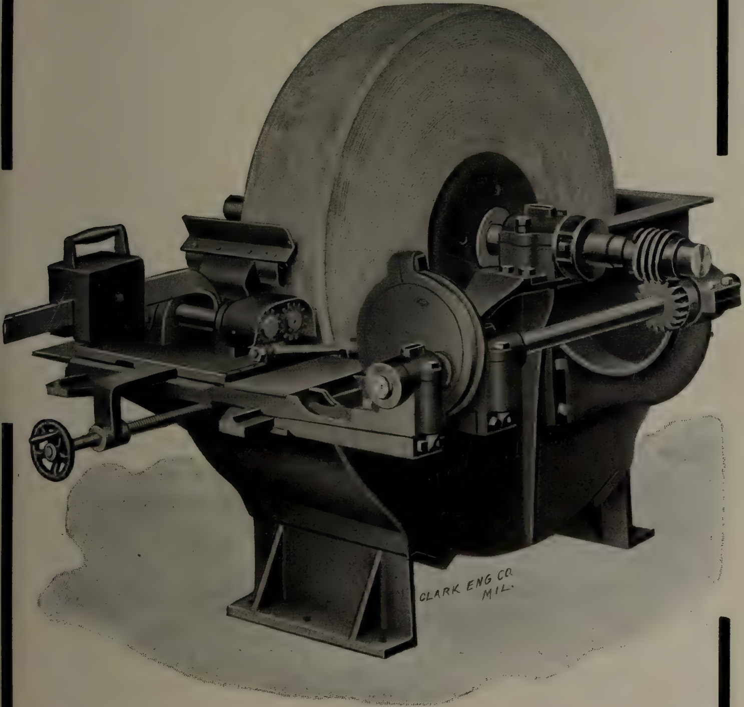
132 NASSAU ST., NEW YORK, U.S.A

The Standard Paper Tube Works, Lowell, Mass., write the "Pulp and Paper Magazine" as follows: "We really feel that we have got some orders through your kind efforts, and we hope before the year is out to have many more. Again thanking you, . . ."

The Limit Holders' Association of the Province of Quebec held their annual meeting in Montreal and elected the following officers: Alex. MacLaurin, president; C. J. Booth and H. M. Durant, vice-presidents; and P. G. Owen, secretary-treasurer.

Valley Iron Works Co.,

Paper & Pulp Mill Machinery Specialists



AUTOMATIC BARKER KNIFE GRINDER.

This machine has a capacity of 150 perfectly ground knives per day, and does not draw the temper of the knife—therefore effects a saving in your knife account. It is the only machine of its kind on the market.

WRITE US FOR PRICES.

Valley Iron Works Co., Appleton, Wis.,
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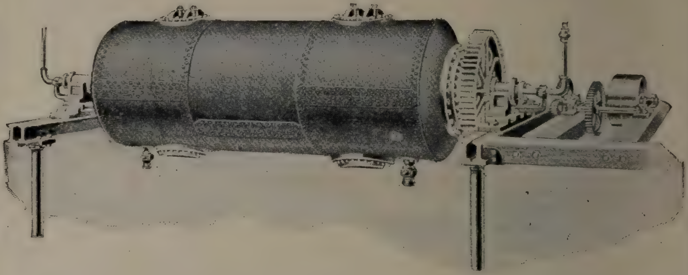
Holyoke Steam Boiler Works,

INCORPORATED **HOLYOKE, MASS., U.S.A.** T. H. SEARS, Mgr.

MANUFACTURERS OF
EXTENSION FURNACES, HIGH PRESSURE HORIZONTAL TUBULAR BOILERS, IMPROVED DIGESTER, IMPROVED VERTICAL BOILERS.

Improved Rotary Bleach Boilers.



This cut illustrates our improved rotary bleach boiler the result of more than 30 years careful study and experience. The most complete of its kind in the world. Over 500 in use in Canada, United States and Mexico

We are specialists in boilers and furnaces for pulp and paper mills. Let us know your requirements.

T. J. MARSHALL & CO.

The OLDEST & LARGEST MANUFACTURERS of **DANDY ROLLS** IN THE WORLD

BANK NOTE MOULDS, DECKLE STRAPS, CUTTING MACHINES, ANIMAL SIZING MACHINES, PATENT DANDY ROLL CARRIAGES, PAPER TESTING MACHINES, PAPER SCALES, &c.

Established 1792.

By Special Appointment to H.M. Stationery Office

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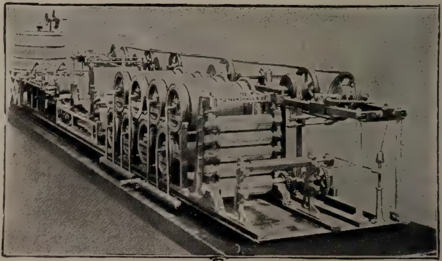


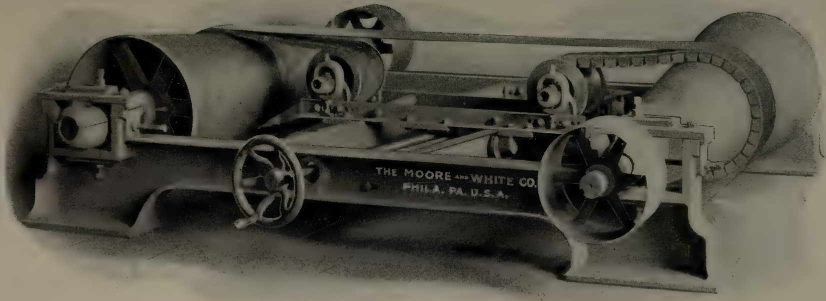
FRONT PERSPECTIVE.

Manufacturers of the Smallest Paper-making Machine in the World.

Specially constructed for Mill Testings before Making the bulk, the same results being obtained as from a wide Fourdrinier Machine. Also for Technical Instruction.

T. J. MARSHALL & CO., CAMPBELL WORKS, Stoke Newington, LONDON, N.

"Moore & White" SPEED CHANGE for Paper Machines.



WIDE BELT. PERFECT CONTACT.

ANY DESIRED RATIO OF CHANGE.

Absolutely No End Thrust or Tendency Sidewise of Transformers or Driving Belt.

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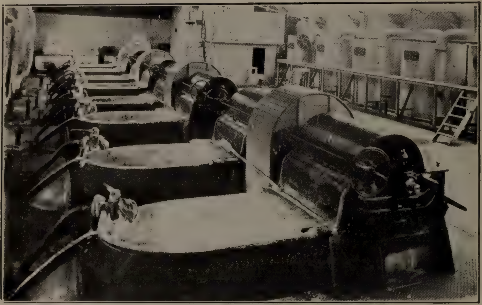
BUILDERS OF PAPER MAKING MACHINERY

Masson, Scott & Co., Limited

Paper-Makers' Engineers



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Patent Machinery for Bleaching and Beating.

Strainer Plates. Closing Strainer Plates.

Sole British Agents for

Robert Dietrich's Kneader for Pulping Paper Stock

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LONDON, S.W., = = ENGLAND.

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500 Twelve-Foot Logs per Hour

Cut into two-foot lengths ready for the barker. That is the ordinary capacity of

Perron, Gagnon & Co.'s Automatic Pulp Wood Sawing Machine.

(Patented in United States and Canada, 1900 and 1906.)

One man alone operating the machine can cut 5,000 logs every ten hours without much exertion. Logs automatically conveyed to the saws, and from the saws to the barker.

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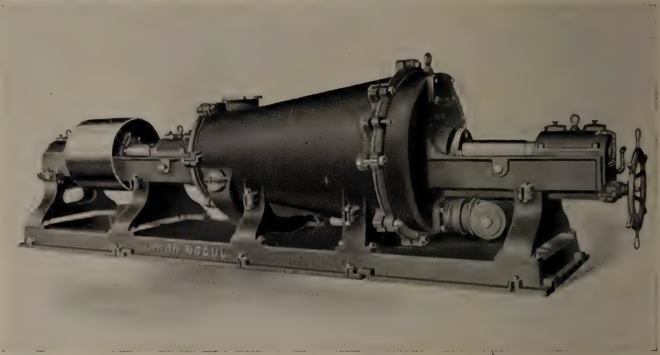

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Montreal, May 15, 1907.

All kinds of paper stock are in good demand. Prices are firm, with some slight increases, particularly manilla rope, which appears to be getting gradually up to last year's figures. The best qualities of new cuttings are the only dull feature in the list. There is a continued movement of cotton rags from here to mills in the States. Canadian mills preferring to let them go away, rather than pay advanced prices.

There is still an active demand for roofing stock which is quite scarce and seems likely to continue so for some time. Stocks of waste are small, as though the production is large, it is fully kept pace with by the demand for all classes of business.

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White shoe clips	4.50	to	5.00
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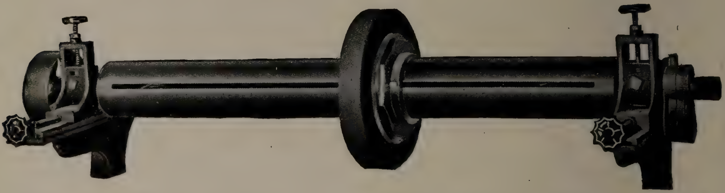

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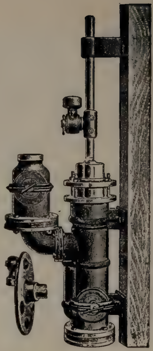

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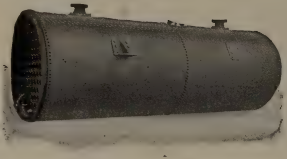

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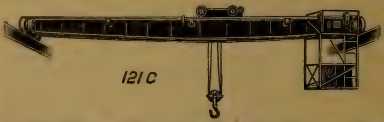

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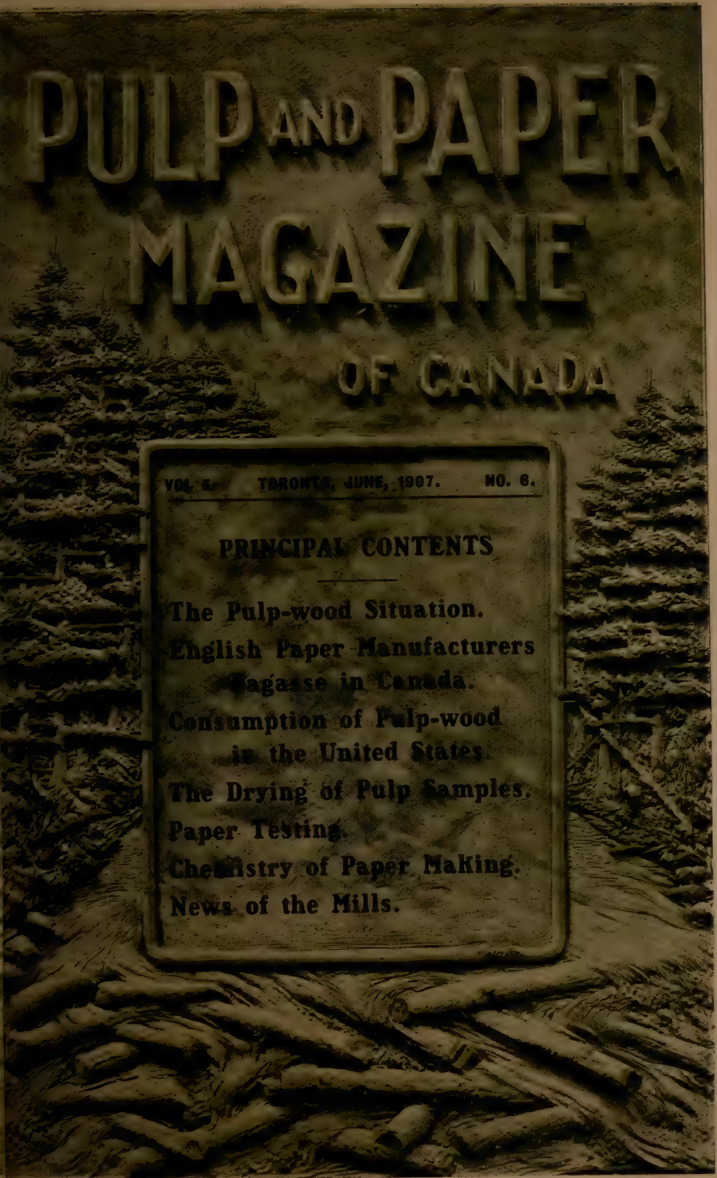

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News of the Mills.

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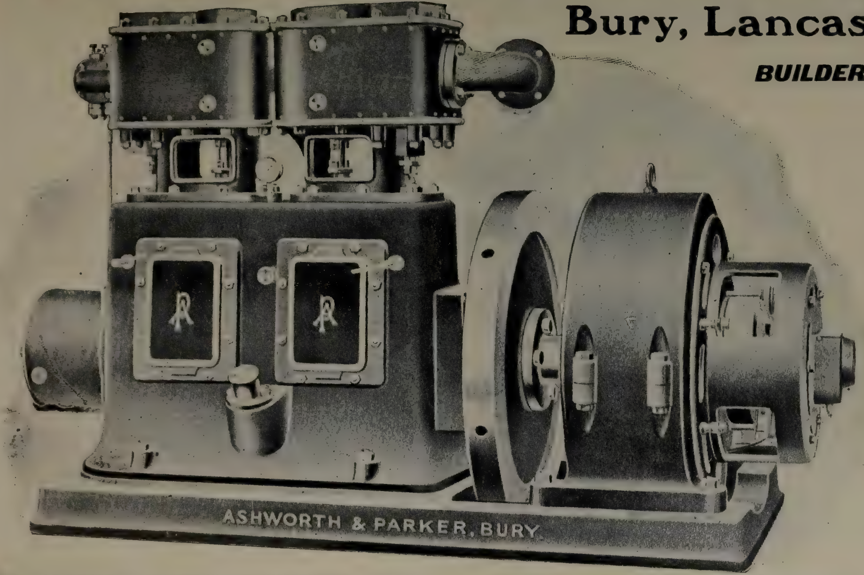

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No professional analyst finds any difficulty in testing papers sized with glue, as distinct from vegetable substances. Nevertheless, it will be of interest to our readers to learn methods which are within the reach of any intelligent person, and are easily carried out. The methods about to be described are not only accurate and rapid, but can be applied to very small quantities of paper.

Boil a piece of paper about four inches square in ordinary drinking water; filter hot, and add a strong solution of alum and the same of tannin, both in ample amount. If a precipitate is slowly formed consisting of a large number of big flakes, either glue or starch is present, or both. To see whether the precipitate contains animal glue, it is boiled together with the supernatant liquid. If it disappears, or nearly so, it shows that the paper has been sized with starch; in the reverse case the sizing has been done, mainly at least, with glue. To be quite certain, allow the precipitate to settle, and after having decanted the liquid examine the precipitate microscopically, adding very dilute tincture of iodine to the slide. Under these conditions glue gives a yellow or yellowish brown color. while starch produces a distinct blue. If no microscope is available, heat some of the precipitate on platinum foil, when the presence of glue will be betrayed by the burnt-horn smell of the fumes.

One source of error remains to be noted, viz., that papers not sized with glue give precipitates of alum and tannin; but the precipitates produced by those reagents which are not due to glue appear only after long boiling. They are in smaller flakes than those above mentioned, and settle more rapidly. Again, when heating on platinum foil they do not produce the characteristic smell of burnt glue.—Moniteur de la Papeterie.

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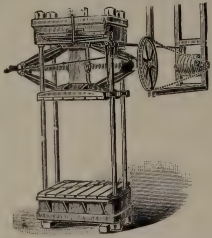

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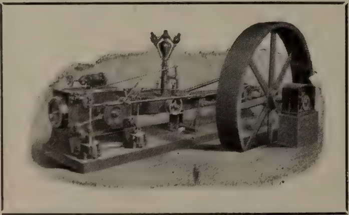

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THE
PULP AND PAPER MAGAZINE
OF CANADA

VOL. 5.—NO. 6. TORONTO, JUNE, 1907. {$1 A YEAR
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Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade.

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The Pulp and Paper Magazine is published on the third Tuesday of each month. Changes of advertisements should be in the publishers' hands not later than the 10th of the month and, where proofs are required, four days earlier. Cuts should be sent by mail, not by express.

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THE SITUATION.

It is too early to make definite calculations as to the quantity of pulp-wood cut this last season. In Canada, however, according to present appearances, the cut has been very fair; in the United States, less so. The precipitation this spring was somewhat low, and little water was flowing in several streams, particularly in the Adirondacks district of New York. On the other hand, it may be stated that on the 2nd inst. the Ottawa River was higher than has been known for thirty-eight years; in fact, some of the mills were inconvenienced for a short period by too much back water. These circumstances would seem to portend good floating conditions.

The demand from American mills is still a pressing matter. There is evidently a shortage of spruce to face the keen demand. The Quebec people have been quick to size up the situation, and the high prices they are now getting make a serious problem for the United States mills depending on that source of raw material; and it may be remarked that still higher prices are due from American publishers to the paper manufacturer to allow the latter to break with any kind of profit, and especially in view of eight hours work and higher wages.

As to ground wood, the fires at the Soo and Green Mount took off the market at least 150 tons per day. Last year J. R. Booth had 75 tons per day available for the market; now, that quantity is all going into paper. As an offset to this, the Spanish River mill is running full blast, and making, possibly, 30 or 40 tons per day more than a year ago. It is understood, however, that that mill is sold out until September 1st, a fact which means a good deal, as the intervening months cover the dullest part of the year, and little stock will be left for low-water periods. Not many mills have any stock piled ahead to meet such conditions.

Pulp-wood prices are at least $1.50, and in some cases $2 and $2.25, in advance compared with this time last year. Speaking to a prominent pulpwood dealer a few days ago as to the prices of ground wood delivered to paper mills, he said that for any tonnage he might have to sell the price would be $30, and that he was prepared to pile pulp rather than let it go for a cent less. He felt assured that there would not be much risk of holding it at that figure. In many cases it is a question of getting ground wood rather than one of price.

ENGLISH PAPER MANUFACTURERS AND AMERICAN.

It seems strange that in spite of the preference, English manufacturers seem so often unable to export paper to Canada with advantage. We hear of several cases in which Canadian dealers, with a strong desire to get goods from Great Britain, if prices should be on anything like an equality with those charged by American manufacturers, have gone into full particulars with English houses as to freight and customs and other charges, telling them that if they will accept such and such a price (the same as that gladly quoted by their rivals on this side) they will get orders regularly. But, no; in spite of the preferential discount in the duty the best figure they can make is ¼d. or ½d. above the Americans. Part of the increased total laid-down price for British goods comes from the necessity for making extra allowance for casing. Of course, there are many cases in which the British manufacturers seem to be trying to meet the conditions. In fact, we have heard of one or two instances lately where orders, which had been going to the United States for a long time past, have now been given to the Britishers. But there is a feeling that if the latter would get down a little closer to business, these instances might be greatly multiplied.

BAGASSE IN CANADA.

T. R. Rhoder, of Albion Street West, London, Ont., writes an interesting letter to the Pulp and Paper Magazine in regard to Bagasse. This material which, as is generally known, is the refuse of sugar mills, has not been used in any Canadian paper mill, so far as we know, except perhaps for experiment. Mr. Rhoder has a shipment on hand and wishes to introduce the material to paper makers. He informs us he would be willing to have it put into paper at his own cost.

We may state that among all the so-called new materials for paper-making, few show better signs of real promise than Bagasse, which has called forth commendation from several expert sources. Heretofore, it has been used mainly for fuel at the sugar mills, but even in the sugargrowing districts of Louisiania its relative value for this purpose has been declining, owing to the introduction of cheap oils. It is generally believed that southern sugar planters would co-operate in creating a market for Bagasse as a paper-making material.

The quantity of Bagasse available in the world's markets is estimated at about 5,973,000 tons, of which 500,000 tons would be in Louisiania, and 1,500,000 in Cuba, and 214,000 tons in the British West Indies.

We hear of several enquiries being made by United States parties interested in pulp-wood, on the possibility of securing immediately concessions in Northern Ontario. This is due, of course, to the fact that the cut in the Northern and North-eastern States has diminished, and shows signs of still more rapid diminution in the future, which leads several of the larger companies to look for new sources of supply. The Ontario Government, however, takes the ground that no such privileges will be granted except as a result of tenders called by public advertisement.

* * *

A correspondent in the United States, well acquainted with the ground wood and sulphite situation, writing to the "Pulp and Paper Magazine," says: "My impression is that many ground wood mills must be built in Canada in the near future to supply the steadily increasing demands from the United States. The sulphate pulp is a neglected industry in Canada, and there is certainly good money in it if an undertaking in that line is carried on properly. I am looking up this matter abroad, and may be in position to communicate with interested parties in Canada."

* * *

—There would appear to be a new market for Canadian pulp opening up in Australia. The price of timber suited to the making of butter boxes in that country has made great advances, and this has led to experiments in making them out of wood pulp. These have shown that the material is free from any odor likely to taint the butter; also, that it is very strong and convenient to the purpose. The importation of ready-made boxes, however, would be attended with heavy expense for freight, and, as a consequence, a company is likely to be organized for the manufacture of boxes from material shipped into the country. Canada should be able to supply the wood pulp to advantage.

* * *

—Some of the evidence brought forth in the "Le Nationaliste" libel case in Quebec makes strange reading for those interested in the timber and pulpwood resources of that Province. Baron l'Epine declared that Hon. A. Turgeon had given him to understand that companies receiving large grants or concessions in the Province of Quebec were supposed to reserve a certain sum for election funds and that the latter made a specific demand for 30c. per acre on 500,000 acres, which a Belgian syndicate, whom the Baron represented, was bargaining for. In other words, he stated that Mr. Turgeon had asked $350,000 for the land and $150,000 for party purposes. The latter positively denies having made any such demand. The only thing we can say is that it is a great pity that such charges and counter-charges are even possible in a matter affecting so closely the development of the great resources of a Canadian Province.

* * *

A paper mill has been added to the Pulp Mills at Milton Falls, N.S. A new company has been organized of Nova Scotia capitalists, and this has purchased the pulp mills and timber limits from the old proprietors. The output is now about 30 tons of pulp per day. The capacity of the paper mills will be about 7 tons per day.

PULP AND PAPER NEWS.

Two prominent Wisconsin paper manufacturers were in Toronto a couple of weeks ago. They were on a visit to Canada, looking for sites for pulp mills.

* * *

Roe and Abernethy, Limited, has been incorporated under British Columbia laws, capital stock $350,000, to carry on business as pulp and paper manufacturers.

* * *

Hugh Mavor, employed on a wet machine at Davy's Pulp Mills, Thorold, Ont., had his hand caught in the machinery and three fingers severely lacerated.

* * * *

The Jordan River Lumber Company, Limited, has been granted a British Columbia charter authorizing it to construct and operate pulp and saw mills. Capital, $300,000.

* * *

In the matter of the Imperial Paper Mills, the actions of Craig against Cinch, and Diehl against Carritt, came before the courts again last week, but were again adjourned.

* * *

The Summit Lake Lumber Company, Limited, has been incorporated under British Columbia laws, with a capital of $100,000 to carry on business as pulp and paper manufacturers.

* * *

The E. B. Eddy Company, Hull, Que., is rushed with orders, and are shipping out large quantities of stuff daily. In spite of the recent advances in wages, there is still difficulty in obtaining sufficient labor.

* * *

Work is going on apace in the Harmsworth concession at Grand Falls, Newfoundland. It is hoped to finish the large new dam by next fall. A large steel and concrete store is being built for the purpose of storing pulp.

* * *

A. H. D. Ross of the Dominion forestry service has been appointed lecturer in the new faculty of forestry in connection with the University of Toronto. A. J. Zavitz, of the Ontario Agricultural College, has been mentioned in connection with the same department.

* * *

F. W. Bowater, of the well-known British paper firm of W. V. Bowater & Sons, London, has been on a flying trip to Canada, having visited Newfoundland, Grand Mere, Shawinigan, and Toronto. He is interested in the possibilities of importing paper from Canada.

* * *

The Berlin Falls, N.H., Pulp & Paper Mill Co. have purchased large tracts of timber land on the Halifax and South-Western Railway line in Nova Scotia. Another New Hampshire Company has bought the Owen-Kaulbach timber limits, comprising 27,000 acres of pine lands on the Sable River.

* * * *

The Sturgeon Falls Pulp and Paper Company is working to its full capacity. Some slight labor difficulties which loomed up a few weeks ago have, it is understood, been satisfactorily settled and orders are coming in. Large orders for coal were recently placed for immediate delivery.

* * *

In the case of the Canada Atlantic Transportation Company against the United States Government to return certain sums of money paid by that company for duties on pulp-wood sent to Fox River Valley Mills, the Federal Court at Milwaukee affirmed the decision of the appraisers, and the case has been sent to the Court of Appeals for review. The company claims that the wood was not cut from crown lands, and that the duty was wrongfully collected.

* * *

The Davy Pulp Mill, Thorold, Ont., held a formal opening at which many prominent pulp men were present. The cost of the repairs and improvements recently put in under the personal supervision of Mr. Davy and E. P. Foley, the foreman, was about $12,000, and the mill is now in an excellent position. A large quantity of pulp-wood is on hand, and further consignments coming in all the time. Several carloads of paper have already been shipped.

* * *

Work is making good progress on the power development at Fort Frances, Ont., where from 40,000 to 65,000 horse-power is to be generated. Half of this will be created by water falling 65 feet into eight great wheel pits on the Canadian side. The retaining wall will be 210 feet long and 110 feet thick of solid stone and concrete. On the United States side the plant is being duplicated, according to agreement. When the proposed large pulp mills on the Canadian side are in operation the pulp, still in wet form, will be pumped across the line where it will be made up into paper.

* * * *

We regret to learn of the death of John Waldie, the well-known lumber manufacturer, which occurred in Toronto on June 12th, after a short illness. He was born in Scotland and came to Canada as a young man, settling in Burlington, Ont., of which place he afterwards became Reeve. He sat for Halton in the Dominion Parliament from 1887 until 1891. He engaged first in the lumber business some twenty years ago, and was president of the Victoria Harbor Lumber Company. He was a director of the Toronto Paper Company, Limited; the Canada Coating Mills, Limited, and was interested in several other enterprises.

* * *

The deal in connection with the consolidation of the Brompton Pulp and Paper Company, of Brompton Falls, Que., and the Royal Paper Company, East Angus, Que., has at length been finally completed. The new concern, of which Frank N. McCrae, of Sherbrooke, Que.; J. Van Dyke, of Boston; J. B. Bearce, of Lewiston, Me.; Mr. Munroe, of Auburn, Me.; and Jas. McKinnon, of Sherbrooke, Que., are the most prominent members, now own large timber limits north of Sherbrooke, Que., three well-developed water power rights on St. Francis River, a new soda mill, two paper mills, and a saw mill at East Angus. Olai Bachewiig, a Norwegian, who has recently been in New England as a chemical paper mill expert, has been placed in charge of the Royal Mills which will be started up by August These mills are being overhauled, and the new company will erect a mill operating the sulphate process as carried out in Norway. This mill will be equipped under the special direction of Mr. Bachewiig. Mr. McCrae has been elected president of the newly organized company, which will have a constant demand for all the chemical fibre it can produce over and above the requirements of its own mills.

* * *

By order in council of the Ontario Government, the Kaministiquia Power Company are confirmed in their rights at Kakabeka Falls. They are to pay the government at the rate of twenty-five cents per horse-power per annum on all power developed at the falls in excess of 10,000 horse-power, The government will build, maintain and control a dam at Dog Lake, the source of supply for the falls; for storage purposes. The government will regulate the flow from Dog Lake for the general benefit of all water-power developments on the Kaministiquia River, including Kakabeka Falls. The company has already made considerable expenditure at the falls.

PAPER TESTING

In a circular issued by the Washington Bureau of Chemistry, the methods and tests by which the composition and value of paper are judged, examples illustrative of the nature and interpretation of results and brief outlines of the characteristics which the more important classes of paper should possess are given.

At present the Leather and Paper Laboratory and the Microchemical Laboratory are equipped to make the following physical and chemical tests, classified as quantitative and qualitative: Quantitative tests: Kinds of fibres or stock, i.e., rag, esparto, spruce, ground wood, etc.; quantity of each kind of fibres or stock as per cent. of rag, of spruce, of manila, etc.; average length of fibre; weight per square metre or per ream; thickness; mean breaking weight; mean breaking length; loss of strength in folding; mean stretch; loss of stretch in folding; transparency; moisture and ash; absorptive power of blotting paper. Qualitative chemical tests: Kind of sizing; character of sizing; kind of loading; reaction; bleaching agents; chlorides and sulphates.

Inasmuch as strength varies with the direction of the paper, tests are made on strips cut both lengthwise and across the sheet. The average of these tests gives the "mean" mentioned in the following descriptions: All of the strength tests are based on an atmospheric humidity of 65 per cent. When so desired strength is reported as pounds per square inch, as determined by the standard American testing machines, no correction being made in this case for variation due to the moisture content of the air, as these machines give only approximate results.

Unless otherwise requested, weight, thickness and strength will be expressed in the metric system.

(1) Kind of fibres or stock is determined by microscopical examination.

(2) Quantity of each kind of fibre or stock is determined microscopically by a count of the fibres of the different materials present, and will be expressed as "percentage by count" on the basis of the stock. The Bureau is not yet ready to say how close this "percentage by count" will agree with "percentage by weight," but there is every evidence that the error, if any, is not greater than obtains in the manufacture of paper. The actual percentage of stock in paper is found by subtracting the sum of moisture, ash, sizing and coloring from 100. As the determinations of sizing and color are not usually made, the percentage of stock in all such cases can only be approximated.

(3) Average length of fibres is determined by microscopical measurements and is expressed in millimetres.

(4) Weight is expressed in grams per square metre, or, when so requested in pounds per standard ream (24 by 36 inches).

(5) Thickness is expressed in millimetres, or, when so requested, in the thousandths of an inch.

(6) Mean breaking weight is the average weight in kilograms (1 kilogram equals 2.2046 pounds) required to break a strip of air-dry paper 15 mm. wide and 180 mm. long (0.5905 inch wide and 7.087 inches long).

(7) Mean breaking length is the mean length of moisture-free paper expressed in metres (1 metre equals 3.2808 feet) which if suspended by one end would break of its own weight.

(8) Loss of strength on folding is the decrease in strength caused by folding the paper a stated number of times under a uniform load of 7 kilograms, and is expressed as percentage on the basis of the mean strength.

(9) Mean stretch is the elongation before breaking of the paper when subjected to a pull sufficient to break it, and is expressed in percentage.

(10) Loss of stretch on folding is the decrease in strength due to folding the paper a stated number of times under a

uniform load of 7 kilograms, and is expressed on the basis of the mean stretch.

(11) Transparency is penetrability to light, and is expressed as the thickness of the paper through which a standard flame can be barely distinguished.

(12) Moisture and ash are expressed as percentage on the basis of the air-dry paper. Loading as distinguished from the normal mineral content of the paper and that added in the sizing and coloring cannot be definitely determined, but may be approximated for different kinds of paper. At present no corrections will be made for the loss on ignition of water of constitution or hydration present in China clay or other loadings, but the practice of the Bureau may be changed at any time on this point.

(13) Absorptive power of blotting paper is shown by the height in millimetres to which water will be drawn in ten minutes' time by a strip of the paper 15 millimetres broad.

(1) Kind of sizing includes a statement as to whether rosin, animal sizing, starch or casein (as far as the latter can be differentiated from animal sizing) has been employed.

(2) Character of sizing refers to the resistance of the sizing and for the present is reported as "excellent," "good," "poor," and "very poor."

(3) Kind of loading is reported as clay (kaolin), pearl hardening (sulphate of lime), agalite, barytes (blanc fixe or permanent white), silicate of soda, etc. (See also "12, Moisture and Ash.")

(4) The reaction of a paper may be alkaline, neutral or acid, and papers are reported as alkaline, neutral, faintly acid and strongly acid.

(5) Bleaching agents when present will be reported.

(6) Chlorides and sulphates are reported at present as "trace," "low," "medium," "high."

BRITISH PAPER TRADE.

The British paper industry is improving its position. During the past year, the exports have materially increased, and the imports decreased.

The decrease in the imports of paper into the United Kingdom during the first four months of the present year amounted to £53,712, the total value standing at £1,865,943, as against £1,919,655 for the corresponding period of last year.

The exports of British paper showed a steady expansion; there was a further increase last month amounting to £47,206, the total value being £194,533, as against £147,327 in April of last year. The April shipments were as follows:—Writings, printings and envelopes, to the amount of 110,196 cwt., of the value of £137,534 (as compared with 68,135 cwt., and £94,751 for the corresponding month of last year); hangings, 8,090 cwt., £17,629 (as against 7,094 cwt. and £17,676); bags, 3,000 cwt., £3,110 (as against 2,566 cwt. and £2,877); and other descriptions, 26,107 cwt., £36,260 (as against 21,276 cwt. and £32,023).

From January to April the exports of British paper shows a total value of £756,751, an increase of £104,360 compared with the corresponding period ot last year:—

During January to April of last year writings, printings and envelopes were exported to the extent of 306,612 cwt., of the value of £416,887; hangings, 33,092 cwt., £87,914; bags, 11,166 cwt., £12,394, and other descriptions, 89,527 cwt., £135,196.

The following were the shipments of writings, printings and envelopes during January to April last:—

	Cwt.	£
France	31,443	48,702
United States	6,090	12,804
Other foreign countries.	93,580	126,873
British South Africa...	41,922	49,885
British India	69,840	75,545
Ceylon	5,201	7,145
Straits Setlements	4,589	5,799
Australia	93,049	97,937
New Zealand	33,533	41,533
Canada	19,562	27,101
Other countries	9,390	13,981

A VISIT TO THE WORKS OF JULIUS FISCHER, AT NORDHAUSEN-ON-THE-HARTZ,

The engineering works of the firm of Julius Fischer, Nordhausen, a Hartz, have achieved a high reputation for special machinery for paper printing, etc. The business was founded in 1838, when Julius Fischer started on a very small scale with the construction of mills, and later on produced steam and gas engines. The works are now carried on by Fritz Fischer, who is assisted by his son-in-law (H. Rathsfield), and Mr. Griebel.

Fritz Fischer.

When the present proprietor entered the business in the early sixties he devoted his attention to the construction and perfection of machines for surface color papers, marbled paper, gum paper, chromo, baryta and art paper, and also to wall-paper, and the firm now makes machines only for these trades. Fischer's machines soon took a leading place, and were awarded the chief prize in the International Exhibition of Papermaking at Berlin in 1878, and the distinction was all the more valuable as it was conferred by a jury composed only of papermaking experts.

The great success of the business necessitated expansion, and this was effected by purchasing in 1893 a large piece of land on which a new factory was erected. Almost every year this factory has had to be extended, so much so that at the end of last year the available space was entirely covered over with buildings. Even these extensions have not sufficed; it therefore became necessary to acquire additional ground. A suitable plot, having an area of about 7,200 square yards, was found on the opposite side of the river that flows behind the present premises, and building operations were commenced there at the beginning of the year. The new building is about 164 feet long, and is connected to the old works by a suspension bridge 130 feet long. The whole establishment, including the new building and the bridge, is shown in one of the accompanying illustrations.

Power is obtained from two steam engines and an electric power station driven by a 30 horse-power suction gas engine. The works are up-to-date in every respect, and are fitted with about 120 of the most modern type of machine tools. About 200 skilled hands are employed, a good many having been in the employ of the firm for 25 years and even longer. It is important to mention that the firm own a number of home and foreign patents for important inventions. The offices are fitted up in the most modern manner. Next is the department where the automatic drying machines are constructed. There are also so-called chainless apparatus in course of construction, in which the suspended parts are kept continuously oscillating while the machine is at work. There were also large numbers of automatic rod-feeders for which the firm has recently taken out a patent.

Passing through the large erecting shop in which the side frames of a gigantic 20-color wall-paper machine were being erected, we arrived in the engine-room of the electric power station, and from there we reach the main building which has three floors. The ground floor is used for large and heavy machines, of which there were several under construction or being tested. On one side of the ground-floor is the smiths' shop, and the remaining portion is occupied by machine tools. By carrying out all the operations in connection with the construction of the machines in one shop, it is possible to produce more accurate work, and it is this accuracy and careful construction that has made the reputation of the firm.

The gear-cutting department is particularly worthy of attention, being well provided with tools for cutting wheels from the smallest size to about 9 feet in diameter, and of all pitches.

The second shop in the same building is used for the construction of color machines for chromo, art and surface papers and also for small wall-paper machines from six colors downwards. Like the shop below, it is furnished with all the necessary tools and a portion of it is reserved for the construction of patent measuring, reeling and cutting machines, of which the firm has already supplied 500 which are giving great satisfaction.

In the shop in which the color machines, damping machines, etc., are constructed, are found several surface color machines, and also a complete installation for automatically producing marbled papers. There is also a wide brushing machine for enameling two reels, and a narrower one for wall-paper, both machines having three rotary brushes of the latest pattern. Such machines are made by the firm up to 80 inches wide, and are capable of simultaneously enamelling both sides of double-surfaced colored art papers.

The next shop is used for the construction of reeling and re-reeling machines, color mixing machines, etc. These small machines are made in large numbers.

The top floor of the main building is occupied by a shop for models and patterns, in which are stored patterns of Fischer's machines of earlier constructions, so as to enable parts to be replaced. The patterns of the modern machines are kept at the five foundries which work exclusively for the firm.

The new building comprises two floors, the ground floor having a height of 16½ feet. It is arranged in a similar way to the old works with all the necessary machines grouped together. The driving is effected by a 30-horse-power electric motor. On the upper floor there is stored a large stock of wood which is used for the manufacture of suspension bars. Adjoining the store there is a joiners' shop fitted with all the necessary machines and tools. This floor also contains the laboratory in which the tests of printing and coloring are made.

H. Rathsfeld.

The firm makes a point of testing all valuable processes for coloring or printing paper, building the necessary machines and affording inventors an opportunity free of cost of testing their improvements in practice. In this way improvements are thoroughly tested, and inventors of new processes have the advantage of the experience, and the machines of the firm. By this means several important improvements have been introduced in recent years to the advantage of all concerned, especially in printing, as for instance, the photographic printing process of rolls with a seamless surface for wall-paper and cloth printing.

The firm of Julius Fischer is at present in treaty for several important inventions, and if, on the one hand, it makes sacrifices of time and money in testing them, on the other hand, it reaps the benefit by keeping its machines up-to-date, and consequently efficient. From the particulars given above it will be seen that important developments have been made during the last few years, with the result that the firm has to-day the largest works in Europe for the sole manufacture of machinery for making surface-colored, coated, marble, baryta, and wall-papers, etc. As evidence of the perfection and reliability of Fischer's machines it may be mentioned that in many mills they are used exclusively.

View of the Works.—Julius Fischer, Nordhausen.

TRADE ENQUIRIES.

The following enquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these enquiries, with their addresses, can be obtained upon application to Superintendent of Commercial Agencies, Department of Trade and Commerce, Ottawa, or publishers Pulp and Paper Magazine.

546. **Pulpstones.**—A Newcastle firm wishes to get into communication with Canadian buyers of pulpstones.

558. **Timber and Pulp-wood.**—An English correspondent, who is open to represent Canadian owners of timber and pulp-wood properties, and who is able to dispose of large quantities of timber, etc., in England and abroad, desires to hear from parties who have propositions likely to interest him.

621. **Rough Wood Pulp.** — A Cape Town, South African firm, holding good references, desires quotations of very rough wood pulp.

CHEMISTRY OF PAPER MAKING

A review of chemistry of paper for the year 1906 formed the subject of an interesting paper, by Dr. Paul Klemm, read recently before the Society of Cellulose and Paper Chemists at Berlin. Although not remarkably progressive in the development of the chemistry of papermaking, especially in the line of bleaching, sizing and colouring, consequently not affording records of scientific progress of remarkable consequence, yet the past year marked a period of the growing influence of chemistry on the papermaking industry. Many enlightening suggestions have been made, many important and interesting questions have been discussed which promise to bear good results, and in this respect the Society of Cellstuff and Paper Chemists has initiated various measures for accomplishing the solution of a number of scientific questions by offering substantial rewards. By this means we are able to witness excellent preparatory work, and, perhaps, good results in the near future.

The International Congress in Rome during parts of April and May could not claim to be of any notable consequence to the paper industry. Thorpe has increased our knowledge regarding contents of arsenic in paper, a matter of small import to our industry. The father of our society, the untiring Dr. Klein, delivered an excellent lecture on the development of the paper industry toward the solution of important questions.

Expressions explaining the significance of chemistry in papermaking are found especially in an essay by Epsilon, "Chemistry and the Paper Industry," and in Beadle's "Chapters on Papermaking" in the second volume.

Bleaching.—The application of electrolytically produced bleaching solutions has noticeably occupied the attention of theorists and practitioners. Admittedly the consumed quantity of rock salt in the paper industry that serves to indicate the extent of the practically performed bleaching process with electrochemically produced bleaching solutions has been larger than during the previous year. The propaganda made by builders of apparatus for said production has been very lively, and trials have been introduced in many mills. Many dissertations have taken place regarding the correctness of the claim that the effect of bleaching with electrolytical solutions is higher than that of a chloride of lime solution of corresponding contents of hypochloride, a claim that has apparently been conclusively proven by Messrs. Cross, Bevan, and Beadle. Advantages and disadvantages offered in various circuits of electrodes and of their most suitable material have been interestingly discussed.

The appearance of the red coloration of cellstuff during the bleaching process, the question regarding the practibility of applying heat during the operation of bleaching, and the addition of acids to the bleaching solution have also been discussed. The views expressed in the dissertations mentioned are partly contradictory, and it follows that here we stand on a large field requiring experimental labour.

Sizing.—The chemistry of sizing has occupied many minds, and naturally so, because rosin has steadily become a more expensive factor in the raw paper material, and since there are no reliable indications to expect relief many endeavours are consequently made to combat and remove these unfavourable conditions. These efforts are made in two directions, the most radical ones existing in the search for a substitute, and these investigations are prompted by the offerings of large sums of money for the discovery of another material to replace rosin to advantage. Since good money is always desirable, there will be no lack of contestants. However, it seems to be evident that this question is one of those hard subjects offering poor chances for solution. Better prospects are probably in view by the opening of new fields in some of the colonies.

Propositions for partially replacing rosin soap have already been offered; one of which sees a substitute in soluble starch. This means a modification of one of the oldest substances for paper sizing of which it is known that it has the property to form a surface film possessing the quality of a cerain resistance to the penetration of fluids, but of which it is known that, as applied for general sizing, it has not proven adequate for answering higher demands of the nature required for writing with ink.

Collodial bodies, like animal glue, starch, viscoid (derived from solutions of cellulose), cannot resist liquids. Their quality to resist moisture is not sufficiently strong for answering the required degree of so-called water-proofing.

The case is different whenever such bodies form a surface coating capable of resisting the admittance of fluids entirely, only allowing the latter to impregnate their surface. The relatively small portions of writing fluids dry rapidly and experience a retarded speed in their diffusion whereby a deeper impregnation is prevented.

While experimenting in the nineties with soluble starch I found that soluble starch applied to the stuff is not any more adapted to offer a perfect substitute for rosin soap than animal glue, viscose, or similar substances when they are used for sizing purposes.

The question of the sizing quality of starch has also been explained by others, so, for instance, this quality has been entirely abnegated in a publication of the Arabol Company, in which it is directly declared that additions of starch are injurious, also as regards their effect. This is decidedly going too far. Other parties merely deny the waterproofing quality, while they admit good results in the improvement of the other qualities in paper, such as rattle, feel. It appears that this view at present predominates, although there may be some who entertain a different opinion.

The property of starch to increase the density of paper is beyond a doubt, and since the capillary admission of fluids depends upon said density, as it is opposed by the same, there must also exist a favourable influence of starch on the waterproofing quality aside from the effects during the manufacturing process. Under contradictory views of the quality of a body the solution of the question usually depends upon the real handling of the matter. However, a reward offered by the Society of Paper Chemists is expected to diffuse additional light on the matter.

Another way in order to reduce the demand for rosin has been entered more generally, i.e., the endeavour to find improved methods for more rational and more economical rosin sizing, at the same time for improving the process itself. In the first line of thought the idea appears to prevail that the most successful quality of the best prepared rosin size decides the subject; also the still enlarging rosin size manufacturing industry thrives under the influence of this conception. The rosin size in solid form of Karl Stacker, in Dresden, marks a forward step in so far as it reduces the cost of freight. Hilger's size, made by Dr. Kraus, in Leipzic, consists in a gelatinous, watery, readily soluble rosin product.

Boiling apparatus for the prevention of overboiling, thereby speeding the process, and another construction heated on one side only for producing circulation, are suggested.

The question of advisability of purchasing the best made size or to make it in the mill has frequently been discussed; views of men of practical ability differ on this subject.

The use of sulphuric acid for precipitation for partly replacing alum has been recommended by two parties. Unsuccessful results are attributable to unskilled handling of the acid solution. Conditions and limits to be observed regarding the harmless application of the substitute require a more precise elucidation.

The influence of heat on the cylinders as affecting the sizing quality in papers has received repeated consideration—among others by Professor Kirchner and Korschilgen. Professor Herzberg initiated the discussions concerning the influence of heat and other actions on the sizing quality of papers that are made to be smooth only on one side. The treatise has been published by the Royal Testing Institute.

Among many questions concerning various influences on the quality of paper, two questions are especially entitled to our consideration.

One by Epsilon: " Has the drying on the cylinders an injurious effect on the quality of paper? " While the questioner himself seemed to be rather inclined to ascribe the subject to prejudice, Turk, to the contrary, confirms the question most decidedly, especially based on his experience derived from the cellstuff spinning processes. Meantime Dr. Hans Hoffman has found that cellstuff experiences chemical changes under the influence of 90 degs. Celsius, so that it appears at present quite comprehensible why the question must be affirmed.

Another question relating to certain chemical influences has been raised by a papermaker, and has been inserted in the column of "questions and answers" in various paper journals: " Does hard mill water increase the hardness of paper? " Those readers paying attention to the variety of answers to this peculiar question must have dismissed the matter with a certain shrug and a thought " that nothing certain is known." Evidently the question could be decided by comparative trials only.

The equation contributed by " A. K.," according to which the transformed product of lime salts with sulphate of aluminium forms gypsum and oxide of aluminium, and that the action of the latter increases the quality of "feel" in paper, is not convincing, because it does not take into consideration the preceding reaction of the lime salt on the rosin soap. Nearest to the matter of fact appears to be the answer by "Chlorus," who remarks that during his practical experience while using hard as well as soft water in the making of the same grades of paper he could not perceive any difference in the hardness of the sheet, and he arrives at the final conclusion that an immediate connection between hardness of water and hardness of paper cannot exist.

The direct influence of alkaline salts in water on the hardness, i.e., density of paper, is quite insignificant, scarcely comparable with other factors that determine the density, and proves certainly too small to decide the question; also their indirect influences on the process of beating cannot be of any consequence, otherwise the appearance would not have escaped entirely the observation of practical papermakers.

Colouring.—A new scarlet red colouring matter for paper has been placed on the market by Leopold Cassela & Co., at Frankfort-on-the-Main, denominated brilliant-crocein P A; the same is distinguished by being entirely absorbed by the fibres, the off-waters showing no trace of coloration.

Remarkable appears the continuation of efforts to impregnate the paper during its creation with coloured designs that formerly have been impressed during an additional working process.

In relation to these improvements we have to notice a new process for whitening and shading, and especially for loading the web from its starting point on the wire, perfected by Dr. A. Klein at Lipto-Rosenberg and J. Baudisch.

It may be said that the chemical processes in the paper industry are evidently favored with increasing attention, and many have already concluded that the study of this subject pays well. Observations of facts that are made valuable in connection with many others are constantly published. But it appears to me there exists a system that is insufficient for observation in conjunction with precise questions. Regarding the forming of conclusions, they often show the character of subjective trials in explaining without power or proof. The main factor in the promotion of progress in the chemistry of papermaking can be found only in increased experimental labour. The young Society of Cellstuff and Paper Chemists has formulated an abundant supply of considerations, ideas and questions.

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NORWEGIAN PULP CONDITIONS.

C. E. Sontum, Canadian trade agent in Norway, reports very firm conditions in the wood pulp industry.

Of this year's output of mechanical wood pulp in Norway there is at the present moment, he says, hardly more than five to seven per cent. unsold, and, although this winter the production has been larger than ever, there is hardly any pulp at the mills. The prices are steadily rising. Several of the larger mills, therefore, refuse to entertain proposals for contracts over next year, until the autumn is well advanced, as there is no probability of a drop in the value of pulp-wood. It is reported that a number of Norwegian capitalists are going to start a cellulose mill in Russia in the neighborhood of "Archangel." The intended output of this mill is 10,000 tons a year. An application has been made to the Russian Government for obtaining concession and permission to import the machinery for the new mill free of duty. The share capital, which is fully paid up, amounts to somewhat above 1,000,000 kroners ($270,000).

A new paper mill is going to be built at Drammen, Norway, by Messrs. Kierulf & Haavind, proprietors of the paper mill recently started in the same town. The power is to be electricity. Two paper machines, which, it is said, will be the largest yet made for the manufacture of grease-proof paper, have been ordered from Mr. N. Fullner, Warenbrun, Germany, who is a favorably known maker of such paper machines.

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FOREST WEALTH OF NEWFOUNDLAND.

United States Consul G. O. Cornelius, of St. Johns, Nfld., states that the forest wealth of Newfoundland is extensive, and is being more largely developed. The products are varied, the chief lumber being spruce, fir, juniper, birch, witchhazel, aspen, white maple, and white, yellow, and red pine. The white pine is of a superior quality, and the mainstay of the colony's lumbering industry. The spruce is also in great demand for rough work, and is of remarkable strength, though much of it is small, owing to the light soil and so much of the woodland being burnt over. A large and expanding market is being found for both in Argentina. The country is easy of access to the lumberman, the coast line of 6,000 miles being broken by innumerable inlets adjacent to the forest belts, while many of the rivers and lakes are equally well adapted both for floating logs to the mills and for affording horse-power needed to drive the saws. The colony has suffered greatly from forest fires and no adequate regulating of reforesting. It is estimated that during the past century forest fires throughout the island have destroyed about $75,000,000 worth of growing timber.

Negotiations are in progress for the launching of two more large pulp mills in the colony. As all these contemplate, he says, the use of American machinery, it is apparent that the equipment of one or more establishments, each of which represents a capitalization of $5,000,000, will do much to swell the total of American exports to the island. The value of the forest wealth exported from the colony during the last year was $302,758.

COMPOSITION OF PAPER FIBRES.

In determining the composition of various fibres in a paper a microscopical test is the best method to get accurate results, says W. W. in "World's Paper Trade Review." Even when testing only for mechanical wood pulp, such a test should be made, as neither phloroglucin, aniline, sulphate nor Herzberg's mixture of nitric and sulphuric acid will enable one to make accurate tests to determine the percentage.

If the paper is only slightly tinted with metanil yellow, phloroglucin is useless, and so are the other two reagents if the paper should be colored.

To distinguish the different fibres easier under the microscope, Herzberg uses a solution of iodine and potassium iodide, which colors certain fibres, but leaves just as many fibres uncolored. The colored fibres show their structure more prominently under the microscope, and are, therefore, easier distinguished. Jute, mechanical wood pulp, cotton, linen and hemp are colored yellow and brown; sulphite wood, straw and esparto are uncolored. If every kind of fibre could be colored, this method would be quite satisfactory; but as it is most difficult to classify a fibre which looks like an air bubble under the microscope, it requires a very exact study of the structure of the various fibres to identify them.

Herzberg's method of preparing the paper to be tested under the microscope, viz., boiling half hour, washing, grinding up in mortar, etc., is no doubt a very good one, and will do very well for an analytical chemist whose profession is to test paper samples or where time is not an important matter. It is not suitable, however, to a paper mill chemist, who sometimes has 20 or 30 samples to test and some other things to give attention before he goes to lunch. As his work has to be done just as accurately as that of the professional man, it must be performed very precisely; but a different method must be adopted if he is to get his 20 or 30 tests done and quotations made. Any delay might mean loss of business.

A very reliable, quick and practical method of making microscopical tests is the following: Say, for instance, 20 samples have to be tested; the samples are numbered 1-20, and of each sample a small piece as large as a 3d. piece is taken off, and the corresponding number written on it. The use of a "Koh-i-Noor" copying pencil is recommended, as the writing does not disappear when the samples are treated with sodium hydrate. A small porcelain basin about four inches diameter is filled with hot water and a few drops of sodium hydrate concentrate added, just sufficient to dissolve size, etc., and into this the small samples are submerged. These small samples are well stirred with a glass rod to soak them well, and left for about two or three minutes. In the meantime 20 glass slips about 3 by 1½ inches, properly polished, are put in one row on the table ready to receive the 20 samples. The samples are taken out of the basin by means of some pincers and put into a larger basin filled with cold water to get rid of the NaOH. Each sample, after being properly swilled, is taken out separately and put on the glass, the number upward, and dissected by means of a pair of mounted needles, which should be very blunt so as not to tear the fibres, or, better still, a little turned upward, to separate the fibres. Should the fibres stick to the needle or do not separate well, a drop of water will set the fibres swimming, and they can be distributed very nicely.

To make an exact test it is advisable to scrape with the needles through the whole thickness of the paper, thus avoiding taking fibres from one side, as sometimes in making a paper the fibres that are specifically lighter will come to the top of the sheet. Another test of the same sample is made on the other end of the glass slip, and the sample, numbered upward, left on the glass in the middle.

For the second test the sample is turned to the other side, and the fibres taken from a different place, so that on each glass are two different tests of each sample. After each sample is dissected, dip the needles in water, as, should any fibres stick to them, they cannot get mixed with those of the next sample.

As soon as all the 20 samples are dealt with a sheet of clean blotting paper, or better still, a chemically pure filter paper, is put over the whole 20 glasses, slightly pressed, and all the water on them absorbed, so that only the fibres and the samples are moist. If the blotting paper is wooly, it some times leaves a few fibres on the glass, which might be misleading; it, therefore, always pays to get a good filter paper which is a little harder. If any of the samples should stick, press the sheet very hard against the glass, to which the fibres will adhere.

After the water is taken off, a solution of iodine and iodide potassium (iodine by itself is not soluble in water, but will dissolve by adding potassium iodide) is put on each preparation by means of a thin glass tube, which must be very pointed on one end, so that only a drop at a time can drop on to the fibres. Care should be taken that the glass tube does not come in contact with the fibres, as some of them may adhere to it and drop on to the next sample, which would show fibres it does not contain.

Having all the samples treated alike, the whole lot is again covered with blotting paper and the superfluous iodine solution taken up, so that the preparations are just moist. Then, by means of a similar glass tube—but not the same—one or two drops of almost concentrated sulphuric acid are dropped on to the iodine solution saturated fibres, so that all the fibres are covered with the acid. The sulphuric acid will at once change the color of the different fibres. When all the 20 samples or 40 preparations are treated with acid, a thin glass cover about one inch diameter is put over each preparation and testing commenced under the microscope, with a magnifying power of about 250 times.

The sulphuric acid is not taken off with the blotting paper. (The solution of iodine and potassium iodide must be in strict keeping with the dilution of the concentrated sulphuric acid, or the coloration will not take place, or, perhaps, only indistinctly.)

By using the above-named reagents:

Sulphite wood pulp will be colored very bright blue; a long, clear, fibrelike wood shavings.

Mechanical wood pulp, yellow; fibres of all shapes, like sawdust; hot ground mechanical has more long, thin fibres.

Hemp, violet; a thick, long fibre, very raggy and twisted; if beaten very wet, little fibres and rings, etc.

Straw, very deep blue, quite distinct from the sulphite blue; fibres mostly thin, mixed with some of the appearance like bladders, and some like pieces of broken saw blades, with teeth on both sides.

Jute, brown; long fibres, knotty, like a bamboo stick, and very often the fibres show in bundles.

Linen, light violet; similar to hemp, but fibre not quite so thick, and the ends of single fibres like small brushes, parting all into many little fibres.

Cotton, dark violet; a clean fibre like a flat hosepipe; always twisted.

Esparto, violet; similar fibre to straw but no bladders, some fibres like boot nails, thick head and thin ends; if these present always look for esparto, broken saw blades, same as straw, but teeth not so prominent.

Soda poplar, violet to dark blue; a short fibre, nearly as thick as sulphite, but tapered ends, some of the fibres like large pieces of broken hose-piping, covered with little dots and rings.

Manilla, a very light brown; very long, smooth fibre, gradually pointed at the ends, similar appearance as a glass rod.

Sisal, yellow brown; long fibre, similar appearance to linen when well beaten, same brushy ends, but brown instead of violet.

Soda pulp, violet to dark blue; fibre same as sulphite, but clearer, and eyes and spurs (the characteristic signs of wood) more prominent.

Brown mechanical, yellow; fibres of the same appearance as sulphite wood, but brown, and not blue, as sulphite.

It is impossible to give an exact description of the characteristic features of each fibre, but the above sufficiently show that the method of testing with iodine and sulphuric acid is far superior to the one with iodine by itself. Tests made in this way take about five to six minutes each, and, as each sample is tested in duplicate, errors are reduced to a minimum.

It is next to impossible to learn microscopical testing by books, as it is entirely the eye which has to be educated. Some standard preparations for reference are necessary. By the above-described method of testing—coloring all the fibres—pretty accurate results can be obtained. The best plan of training is to keep a preparation for each kind of raw material for reference. An advantage of testing with iodine and sulphuric acid is that the preparations can be kept between the glass slips for many weeks without getting discolored, whereas in Herzberg's process the discoloration takes place rapidly.

HISTORY OF THE PAPER TRADE.*

A book which should be read by everyone possessing an interest in industrial developments but particularly those connected with the branch of which it treats is the descriptive and historical survey of the Paper Trade, by A. Dykes Spicer, M.A., just issued. While paper manufacture has never bulked so large in the world's industries as that of cotton or wool or hardware for instance, yet its uses are so general and multitudinous and it enters so unexceptionally into all other trades, that it may be said that interest in it is universal. Cheap paper has been the chief ally of education in the spread of knowledge among the masses; for without it, the penny press and universal postal facilities would have been impossible.

The present book takes up the subject from the second half of the 18th century, up to which time paper had been produced by hand. About that time several mechanical improvements were made, the ultimate result of which was a large demand, and the search for new supplies of raw material.

The fluctuations of the industry in the British Isles are described at length. At the beginning of the nineteenth century the mills numbered about 500; thirty-five or six years later these had increased to about 525. Since that time, however, there has been a general decline in the number of British paper mills, due for the most part to the dropping out of the small vat mills through the competition of capitalist establishments using large machinery, or through isolation or some other factor of situation. At present the number of paper mills in the United Kingdom is about 279.

An interesting chapter in the book is that relating to the "Sources of Supply," where the relative claims of Scandinavia and Canada are considered and summed up. Norway and Sweden already show signs of timber exhaustion, and though perhaps they have sufficient for the supply of existing mills and perhaps a few more, our author is of opinion that there is no likelihood of enormous development such as there is in Canada. In knowledge of the customs of the British paper trade, however, the advantage at present rests with Scandinavia, so that he believes the

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* The Paper Trade; a descriptive and historical survey from the commencement of the nineteenth century, by A. Dykes Spicer, M.A. Published by Methuen & Co., 36 Essex St., London, E.C. Price, 12s. 6d. net.

United States may continue the greatest market for Canadian wood pulp as well as for cheap classes of Canadian paper.

The volume is nicely bound in cloth, and is embellished with several illustrations, including some designs from drawings lent by Bentley & Jackson, of Bury. There are also several useful appendices giving information in tabulated form.

PAPYRUS FOR PAPER.

It is well known that the papyrus plant was used in olden times for making sheets of paper, and that many of these sheets have been preserved for thousands of years, and that the writing on the same is still legible.

The firmness of the papyrus sheets or rolls was, however, not satisfactory, because they did not represent an artifically felted sheet, since they were simply formed by a combination of thin strips of the stem of the papyrus plant. The natural adhesive quality of the fibres served to increase the strength and firmness of the sheet.

In case we wish to use this plant for making paper stuff according to present usage we have to regard three principal factors that determine the utility of fibre stuff: First—The purification of the fibre by boiling. Second—The bleaching of the boiled stuff. Third—The structure of the fibres.

It would, perhaps, be best to commence with a consideration of the fibre structure, because a plant containing useless fibres should, from the start, be dismissed as useless. However, the paper analyst usually proceeds in the order mentioned; he dissects the fibre and examines the same under his microscope, therefore I will follow in the same order, says E. L. Selleger in "Papier-Fabricant" (translated by "Paper Trade Journal").

The boiling of the stuff is performed in the same manner as practised in the treatment of straw; the percentage of alkalies required is, however, considerably smaller, because the plant contains a smaller proportion of silicates, and the friction matter represents the principal object for chemical solution.

In a laboratory test it was found very easy to prepare a good quality of fibre stuff by a short boiling process with soda lye, and the prepared half stuff was readily bleached with chloride of lime, presenting a beautiful white shade.

The microscopical examination proved to be the most interesting. The same disclosed that the firmness of the half stuff did not exist altogether in the good felting of the single fibres, but more so in the fact that the fibre cells were mostly combined in long bundles, and these appeared to be firmly intertwined. These bundles disappeared after sufficient beating, and a felting was forced that consisted of extremely fine fibres.

The fibres of papyrus are similar to the esparto fibres, but they are more supple and much finer. The paper made with these fibres will, therefore, appear well closed, of satisfactory firmness, and well adapted for printing. The papyrus fibres are adaptable for coloring like esparto, and the parenchymous cells appear like those of grass plants. In the microscopic picture we distinguish two forms of fibres: the usual fine and pointed fibres, about 1.5 mm. long and up to 0.010 mm. wide, and the longer and wider fibres appearing in a more separated state; these latter measure 5 mm. in length and up to 0.025 mm. in width. They consequently measure about three times the size of the fine fibres that represent the largest proportion, and this fibre mixture of 80 to 85 per cent. of fine admixed with 15 to 20 per cent. of longer fibres is very well adapted to represent a well-felted sheet of paper. We also find as stated the parenchymous cells, but we also distinguish large fibre cells composed of fine spirals, forming a combined long and wide tube.

Thus it appears that the old papyrus stem will again occupy an honorable position, and, though there may be no scarcity of raw materials, we may welcome in its revival a quality of special value for producing many sorts of fine papers that need not of necessity possess extraordinary strength.

IMPORTANT PULP MILL TRANSFER.

Important negotiations have been practically completed in connection with the Spanish River Pulp and Paper Co. Its properties have been sold to a Rhinelander, Wis., syndicate, headed by the Edmonds family.

The concession was originally granted by the Ross Government, under agreement dated September 21, 1899, to the following gentlemen, who were to be known as the Spanish River Pulp and Paper Company: — Marshall J. Dodge, New York; A. R. Creelman, Toronto; William J. Sheppard, Waubaushene; J. J. McNeil, Toronto; W. Irwin, Peterborough; Angus McLeod, Bracebridge; Thomas H. Sheppard, Orillia; George McCormick, Orillia; James Playfair, Midland; Charles McCool, Ottawa; W. D. Lummis, Spragge, Algoma district. The company was given the right to cut spruce and other woods on Crown lands along the Spanish, Vermillion and Onaping Rivers, and their tributaries, with the exception of the Sauble branch of the Spanish River, for a distance of five miles back from the shore. For the spruce cut the Government was to receive twenty cents a cord, and for other woods ten cents a cord. In addition the company was required to erect a pulp mill and a paper mill in connection with the water power it proposed to develop. On the building and equipment of the industry $500,000 was to be expended, of which $100,000 was to be dispersed in eighteen months, $250,000 in two years, and the balance in three years. The mills were to employ 250 hands, and produce in pulp and paper 25,000 tons annually. If these terms were carried out the company was to enjoy the rights conferred on it for 21 years, but in the event of failure to comply with them the concession might be cancelled by the Government.

At the time the grant was made considerable political exception was taken to the smallness of the obligations undertaken by the company, considering the value of the concession. The company erected a dam and works to generate power at a waterpower on Spanish River, which are used for operating its pulp mill at Webbwood. This mill is now producing over 100 tons of wet pulp per day. There is said to be enough wood existing on the property to keep the plant running for a hundred years, but this is probably a figure of speech. Much of the pulp produced will be shipped to Wisconsin. The principal parties interested in the Spanish River Company are: W. J. Sheppard, of Waubaushene; James R. Tudhope, M.P.P., of Orillia; James Playfair, of Midland; Marshall Dodge, connected with the Georgian Bay Lumber Company; John R. Barber, of Georgetown. The price, we understand was in the neighborhood of $2,500,000.

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CONSUMPTION OF PULP-WOOD.

The United States Census Bureau has compiled a very useful comparative report on the consumption of pulp-wood in the United States during the years 1905 and 1906. The figures cover 250 mills in 1906, and 237 mills in 1905.

Kind of Wood	Total cords		Mechanical process, cords		Sulphite process, cords		Soda process, cords	
	1906	1905	1906	1905	1906	1905	1906	1905
Total cords	3,646,693	3,192,123	1,197,780	1,096,794	1,944,136	1,630,393	504,777	464,936
Spruce, dom.	1,785,680	1,650,709	826,511	794,260	945,470	784,674	13,699	71,775
Spruce, imp.	721,322	622,545	290,080	230,289	428,742	392,256	2,500	....
Poplar, dom.	311,763	299,175	10,475	8,592	843	....	300,445	290,583
Poplar imp.	17,550	22,883	2,129	2,800	....	....	15,421	20,083
Hemlock	562,549	375,422	11,869	30,843	516,512	344,579	34,168	....
Balsam	42,576	56,744	11,572	10,801	22,314	45,943	8,690	....
Pine	69,277	57,399	15,116	14,432	3,600	18,600	50,561	24,367
All other	135,976	107,246	30,028	4,777	26,655	44,341	79,293	58,128

These figures are significant because of the increased demand they show all along the line, which in the aggregate amounts to 14 per cent. Should it continue during the present year, which there seems no particular reason to doubt, it will set forth the problem—directly for the United States, and evidently for Canada—in an acute form. Certainly the available supply of the United States is not becoming larger; in fact there is a general admission of shortage. In other words the candle is being burned at both ends; a fact which would show itself even more clearly 11 the importations from Canada were not growing so rapidly. Probably the shortage of pulp-wood in the United States, to meet its manufacturing demands, was no less than 1,106,000 cords, which gives one an idea of its dependence on Canada at the present time.

NEW PAPER AND PULP MACHINERY COMPANY.

The Glens Falls Machine Works is a new corporation which has just been formed, and which will take over the business until recently conducted by the Moore Screen Co., Sandy Hill, N.Y., and Tromblee & Paull, of Carthage, N.Y. The officers of the new company are Z. W. Wells, president; A. R. Paull, vice-president; A. Tromblee, secretary and treasurer. The company is now building a new factory at Glens Falls, N.Y., for the purpose of manufacturing the Moore screen, the Tromblee & Paull rotary sulphur burner, the Cedar Point grinder, centrifugal turbine pumps and other paper and pulp mill machinery. The tools and the entire equipment of the factory will be of the latest and most improved patterns, and will be driven by electricity with individual motors. The building will be one storey, 115 feet long and 76 feet wide, with monitor centre, 26 feet high in the clear and 37 feet wide. The building will be of brick, steel and concrete and fireproof. With a modern shop, and the equipment which it will have, the officers of the company state that they will be able to do first-class work in every particular, and to get it out at the least possible expense. It is hoped that the factory will be in operation by the 1st of July. The offices of the Moore Screen Company and Tromblee & Paull have been moved to Glens Falls, and hereafter all communications should be addressed to Glens Falls Machine Works, Glens Falls, N.Y.

⁂

THE DRYING OF PULP SAMPLES

By J. A. DeCew.

In endeavoring to ascertain accurately the relative proportion of actual dry fibre to wet pulp in a given consignment there are two distinct operations, either of which when inexact may be the cause of an erroneous result. The room for the widest variation is generally found in the sampling, which is the first and in many cases the most important operation. Even if the sampling is most carefully done, however, the results will always be under suspicion if the drying facilities are inefficient or inadequate.

An inefficient drying apparatus is one that does not completely remove the last traces of moisture from the pulp samples, although these at the same time may appear to be quite dry.

This condition is found in ovens where a relatively low drying temperature is maintained, and where the air does not circulate freely, thus leaving a moisture-laden atmosphere in the oven.

An inadequate drying apparatus is one that has not sufficient capacity for the work that is put upon it, and consequently the dried samples are affected by the moisture in other samples associated with them.

From the standpoint of the sampler, an apparatus is required which will not limit him to a very few samples of insufficient size, for the chances of his making an error are thus greatly increased.

Theoretically, every bundle of every kind should be properly and thoroughly sampled, but we generally assume that the same average result is obtained by sampling from every one in ten or twenty, as the case may be.

Even when this is done, the samples are generally cut down and resampled, still assuming that the average result remains the same; but if this process goes on too far, the chances of maintaining the average are greatly diminished.

It is quite possible that a sample weighing one ounce may represent the average of a shipment weighing one ton, but at the same time we must admit that there are a good many chances against it.

In choosing, therefore, between results obtained by different samplers, who may be equally careful and capable, the odds are undoubtedly in favor of the man who has dried the most and largest samples, or, in other words, the one who is provided with the best drying facilities.

What, then, we may ask, are the ideal conditions for effective and rapid drying. Evidently they are not found in an oven heated to a temperature of 160° to 200° F., which depends entirely upon a proper circulation of air to carry away the moisture, for, although it may be effective, it is by no means rapid.

On the other hand, an oven heated

to a temperature of 212° F. is much more rapid in its action, because the water is forced out by the pressure of its own vapor, which forms when it is heated above its boiling point. This drying process is, therefore, not solely dependent on the carrying power of the circulating air.

It is dangerous, however, to maintain an oven temperature very much above 212° F., for in that case the dried pulp will become scorched and the results doubtful. Being limited by this fact, it is possible to obtain only a slight temperature difference between the heating surface of the oven and the boiling point of the water in the pulp, and hence the amount of evaporation resulting from ebullition is not very great.

If now, while maintaining the temperature of our oven's heating surface at, say, 220° F. we should lower the boiling point of the water within the oven to 120° F. we will have a temperature difference of 100° between the body supplying the heat and the water in the pulp, and this means a very rapid absorption of heat by the latter.

This condition is brought about by extracting the air from the oven containing the material, which will then remain at a temperature equal to that boiling point of the water which corresponds to the vacuum applied.

We can now understand why it is possible to dry materials so rapidly under a vacuum, and at the same time without heating it to a temperature that will alter in any way its natural condition.

In conclusion, we must admit that the pulp sampler who can dry a relatively large sample completely and in a short time, through the application of a vacuum to his drying apparatus, should be able to obtain results which coincide more closely with that illusive average that represents the whole than others who are not so favorably situated.

The only objection against an apparatus such as described is the fact that it costs a lot more money than the makeshift types too often seen, but sometimes there is a monetary value in knowing and being able to prove that a certain result is as nearly correct as it is possible to be obtained.

THE REVISED CANADIAN TARIFF.

As it applies to the pulp, paper, and kindred industries, pulp and paper machinery, and mill supplies will be found in the **Pulp and Paper Handbook of Canada,** which will be published in connection with the Canadian Textile Directory. Ready at an early date. Subscription Price, **$2** payable on delivery. Price is **$3** after publication. Order now and save a dollar.

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WOOD PULP SILK

The process of manufacturing artificial silk made from wood pulp is one which in Europe is jealously guarded from inspection. The product is intended to supply the trade with a yarn which will take the place of the product of the silk worm, but it is recognized even by the makers of the imitation silk that its use has limitations. Its fabrication into cloth without the admixture of other fibres is not recommended. On the other hand, it is coming into popularity as the material for both transverse and longitudinal stripes and small figured effects in cloths, the body of which is composed of either cotton, wool or worsted. The aim of the inventors of the several processes is to produce a thread resembling real silk as closely as possible in appearance, feel and wearing qualities. Up to the present a product possessing the two first-named characteristics, but deficient in the latter attribute, seems to have been arrived at. Naturally, then, the price at which the artificial yarn can be marketed must be less than that which the real and well-established silk commands. At this time imitation silk sells for considerably less than real silk, but at a higher price than mercerized cotton, and the exploiters of the patent processes are looking to the time when their yarns will have a settled position in the textile trade between silk and the best qualities of mercerized cotton yarns.

Two processes are employed in England—one in which alcohol is used as dissolving agent of the wood pulp, while in the other process a caustic solution is employed.

The raw material comes from Norway in the form of baled sheets, each sheet being about four feet square. Its price fluctuates from time to time, but fourpence (eight cents) a pound may be taken as the average cost. After the pulp has been dissolved into a liquid of the required consistency, it is forced through a series of microscopic holes, four one-thousandths of an inch in diameter. punched through a thin platinum plate. A "setting" bath (acid) then fixes the filaments so that they can be twisted together to form a workable thread. Usually either 16 or 32 of these capillary filaments go to form what may be termed the "single" yarn. The spinning spindle, which is a weighty affair of some 90 ounces, is gear-driven at 5,000 revolutions a minute, and carries a "cup" into which the yarn is collected in the form of a small "cheese." There will shortly be introduced an improved spindle weighing but 30 ounces, which it is expected can be successfully driven at the rate of 9,000 revolutions per minute. A later arrangement for feeding the "viscose" through the microscopic holes enables a varying pressure to be exerted on the liquid, and by this contrivance different counts of yarn can be made than could be produced by the older arrangement of increasing or decreasing the number of component filaments in the finished thread.

Aside from the apparatus for treating the pulp prior to spinning, the spinning machines are in themselves costly, the present price per spindle being $25, the average production per spindle being 100 metres per minute of a thread having 2½ turns of twist to the inch. So far as British experience is concerned, the development of the work has been most expensive. Starting with the accumulated knowledge of the Continental producers has not prevented comparatively enormous sums being expended in simplifying complicated, though somewhat crude, mechanism and simplifying chemical processes and standardizing the quantities and qualities of the ingredients employed.

The single yarn, bleached and dyed, is put up in three qualities—A, B and C—and is sold in the hank at $1.20,

$1.32 and $1.44 per pound, the cost to the manufacturer of the artificial yarn averaging 75 cents per pound. Of this, one-third goes for raw material and chemicals, one-third for labor, supplies, power, etc., one-third covers interest, depreciation, selling and other general expenses.

Although the English product is as yet limited in volume, an attempt is being made to distribute the output through the greatest number of channels in order to create a demand for the greater weight of yarns to be made by the rapidly increasing number of spindles. Many makers of fancy cotton goods, who sell part of their output in the American market, are and have been for some time using artificial silk for stripes and figures.

Before the true intrinsic value of artificial silk as a textile material can be arrived at, any disadvantage it has must be known. It is much heavier than real silk, and, therefore, more pounds will be needed to supply any given length. It is more or less seriously affected by water and moisture and very inflammable, and both the strength and elasticity of the material falls far below that of the real article. At the same time its brilliancy and lustre are superior to mercerized cotton.

⁂

WASTE LIQUORS.

Dr. J. H. Vogel, of Berlin, says that non-professional opinion frequently fails to distinguish between the waste waters from paper and those from pulp mills. In some cases which came before legal tribunals alleged pollution of streams by pulp factories had been found to result from the presence of living organisms which had entered the streams at other points, and which if removed once or twice a year, could be kept down in numbers.

Paper factories have often been blamed in expert testimony for the presence of paper fibres in the deposits, and the factories in question have been found guilty, although in the absence of recorded cases it is not taken into consideration that plants might have been destroyed by causes other than the fibres.

From details quoted of tests made at various periods of the waste lyes of the Mitscherlich and Ritter-Kellner factories, wood treated in the winter proved richer in saccharine contents than that dealt with in the spring, the percentage by weight of sugar in the waste lye, ranging from one-half to seven-eighths per cent. in the summer to from 1 to 2 per cent. in the winter.

On the principle of the attempts reported to have been made at Chicago for the purification of waste water entering the lake by means of sulphate of copper, attempts have been made in paper factories to prevent the formation of algæ in pipes by the addition of a small quantity of sulphate of copper to the water used.

Dr. Vogel refers to the construction (superintended by him) of a plant for purifying the waste lye of a soda pulp factory in such a way that it would be colorless and free from floating substances. The following guarantees were approved by him as applying to the "biological" process:—

First: Eighty-five per cent. of the floating substances to be removed from the waste water already mechanically purified. Second: The purified waste water not to have a deeper color than that of one part of unpurified waste water mixed with two parts of clear water. Third: At least 50 per cent. of the dissolved organic decomposable substances to be removed, or the liability to oxidation diminished in that proportion.

These guarantees having been officially approved, the construction was proceeded with. The plant was intended for the daily treatment of about 20,000 cubic feet of waste lye. The preliminary mechanical purification was to last three days, the lye passing through three chambers, one of about 31,000 cubic feet capacity, and the other two each about half that size. The waste lye was afterwards to be subjected to oxidation in a coke tower in continuous operation, the capacity of the tower being about 31,000 cubic feet. This installation is expected

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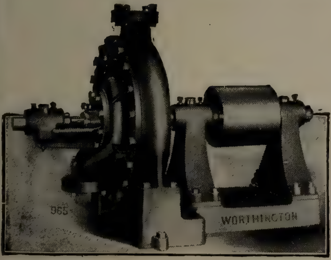

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to be in operation during the coming summer, when Dr. Vogel will test it and will report on its operation.

Observations as to the condition of the River Main showed that no important contamination of the stream had taken place, except in the case of the Stockstadt cellulose factory, from which large quantities of sulphurous acid were discharged (which the stream rendered harmless), as well as a great volume of dissolved organic substances. Every filling of the digester (of the capacity of about 2,160 cubic feet) was followed by the outflow of about 12,000 pounds of organic substances. Owing to the rapid current of the Main River accumulations are infrequent.

From a sanitary point of view, there is said to be little cause for apprehension from such substances, which, however, stop up the fishermen's nets. When there is much ice in the winter there is said to be mortality among the fish. Laundries and any industries using unfiltered water are, moreover, affected by the organic substances. The self-cleansing power of small watercourses should, Dr. Vogel considers, be utilized in proportion to local requirements.

❦

LOADING PAPER.

A patent has been granted to Mr. Alfred Monin, of Lent, France, relating to a loading or filling substance for use in the manufacture of paper.

Hitherto, in the paper industry, says the inventor, natural raw sulphite of lime has been employed as the loading or filling substance in paper pulp, owing to its low price, and also because of its exceedingly white color. The efficiency as regards the filling retained in the paper pulp is, however, small, the raw sulphate of lime forming, when mixed with water, a thin paste possessing small binding properties. On the other hand, it has been found necessary to abandon the employment of natural burnt sulphate of lime as a filling for paper pulp, because in mixing it with water there is obained somewhat rapidly (according to the degree of burning) a hard body and not a paste. Again, when it is desired to obtain very white burnt sulphate of lime, as is desirable when it is to form the filling for paper, its cost price is too high, owing to the difficulty of burning. These inconveniences are obviated by employing a mixture of these two substances, which separately give little or poor result for loading paper. By an intimate and judicious mixture of the two substances a compound is obtained which, on the one hand, does not harden in water like burnt sulphate of lime, and which, on the other hand, gives an exceedingly thick and unctuous paste, which always remains pasty and is consequently adapted for employment as the filling for paper with far greater efficiency than when raw sulphate of lime is employed alone, as this substance gives a paste which is thin and presents poor binding properties when the same quantity of water is used.

Notwithstanding the precautions to be taken in order to obtain burnt sulphate of lime sufficiently white not to deteriorate the whiteness of the mixture, the cost price of the product is obtained sufficiently low to permit it to replace advantageously in the paper industry loading substances which are much more expensive, such as the best white talcs and kaolins of the first quality, which substances are likewise less white than the mixture indicated above, while they are not more efficient than the said mixture.

There is nothing fixed as regards the proportions of the mixture, which may vary in accordance with the degree of burning to which the burnt sulphate of lime employed in the mixture is subjected.

The mixture indicated, which has not hitherto been utilized as a filling for paper, permits of obtaining in the paper industry a novel and economical result, the characteristics of which are to give with water an unctuous and thick paste which is not obtainable with either one of the two materials if employed separately and in the same mixing proportions with water.

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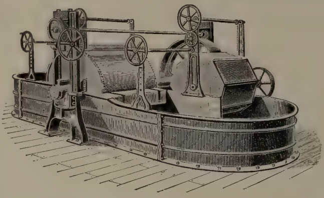

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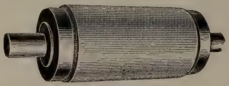

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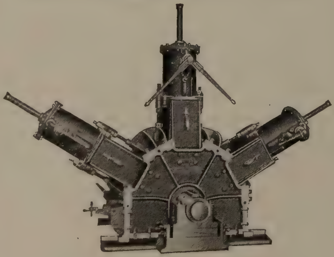

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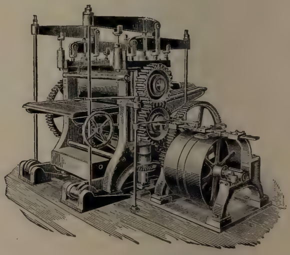

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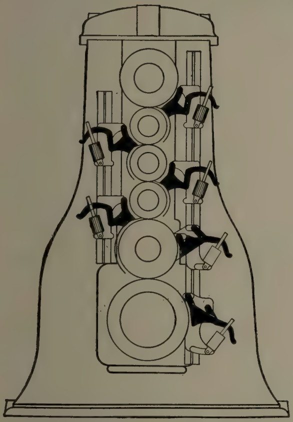

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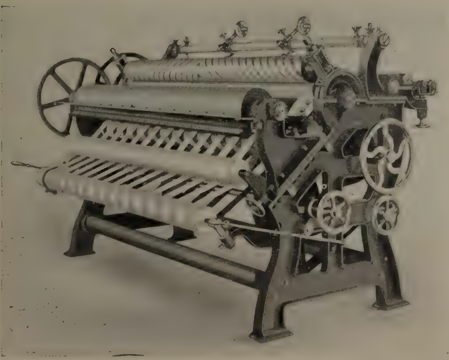

LAWRENCE, MASS., U.S.A

THE MARKETS.

June 15th, 1907.

Pulp.—Prices for ground wood and sulphite remain exceedingly firm, and makers are anticipating higher prices. Ground wood is quoted at $17 to $18 on contracts at the mills in Canada. Sulphite is $42 to $44 f.o.b., mill, or $2.35 to $2.50 on the American side. Further particulars of the position of the market will be found on the article in this number on the "Pulpwood Situation."

Paper.—There is a good business being done in all classes of paper, and news and wrapping are in very keen demand. The manufacturers recognize that they allowed prices to remain low too long, but they are now keeping well to the higher values. As a result the whole trade is in a better position.

British.—"The World's Paper Trade Review" speaks of hardening values for both mechanical and chemical pulps. Buyers seem more disposed to fall in with holders' views regarding prices for next year's contracts.

LARGE ENTERPRISE IN NEWFOUNDLAND.

A. G. Mickleburgh, Secretary of Albert E. Reed & Co., Limited, the well-known London paper makers, has been on a visit to Newfoundland arranging for the purchase of timber areas in and around Bishop's Falls, formerly held by the Exploits Wood Company. The area acquired by the Reed Company will be nearly equal in extent to that of the Harmsworths It operates 7 mills, with a weekly output of 600 tons of various grades of paper, from news print up to the finest coated qualities. It has large interests in Scandinavia, but Newfoundland will be the main source of supply. It undertakes to spend half a million dollars within the next three years. Its town site will be Bishop's Falls, where it will build a dam to cost $200,000. The mills will be constructed of steel and concrete. They will include ground wood, sulphite and paper mills. Active work will begin at once.

* * *

The agitation which is now going on in the Rainy River district for Legislature separation from old Ontario is of interest to the pulp-wood industry. Among the special demands made by the settlers is that the "pulp-wood limits should be fostered," and that a better forestry policy should be inaugurated.

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Pulp and Paper Handbook of Canada

This Directory will give full information regarding the pulp and paper mills of Canada, the officers, managers, superintendents, capacity, power used, particulars of machinery, kind of power used, products of each mill, and selling agents, if any. Also all the available information to the time of going to press of new mills projected; paper box factories, paper bag manufacturers, wholesale paper dealers, jobbers, bookbinders, etc.

THE REVISED CANADIAN TARIFF as it affects the pulpwood, pulp and paper industries, pulp and paper machinery and mill supplies will also be given; also the tariffs of the U.S. and Newfoundland.

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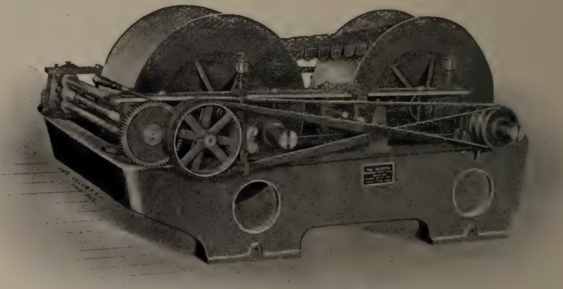

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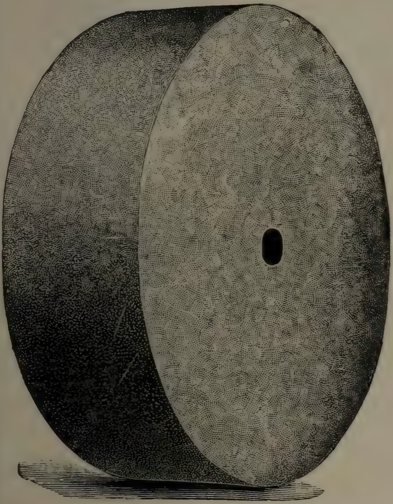

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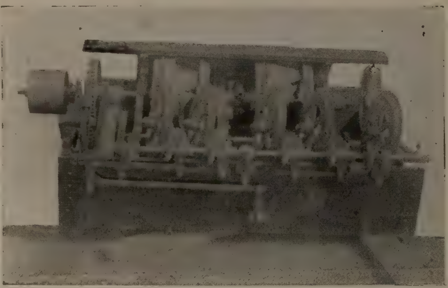

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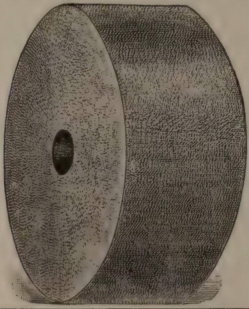

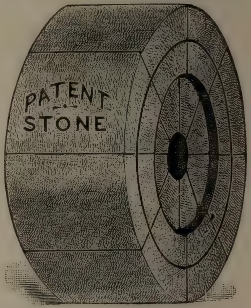

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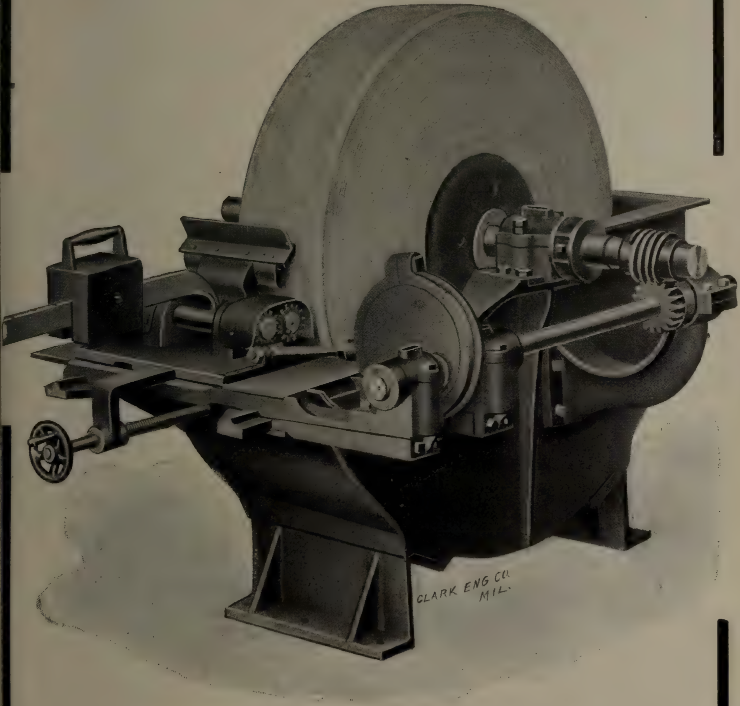

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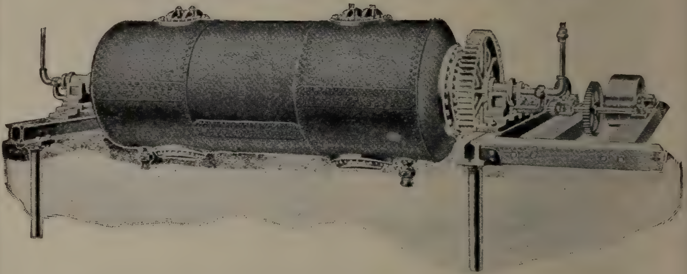

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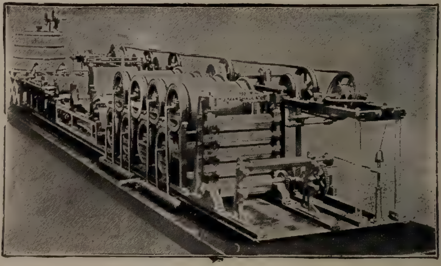

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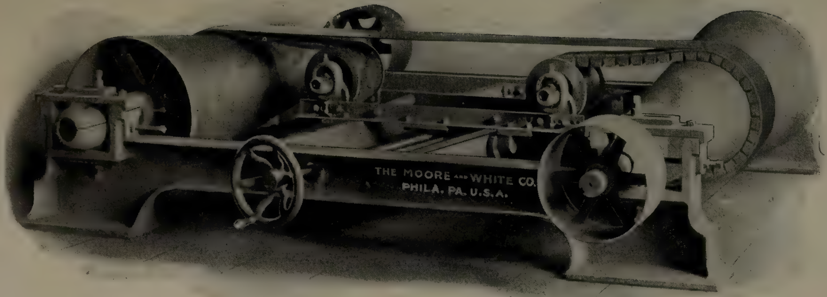

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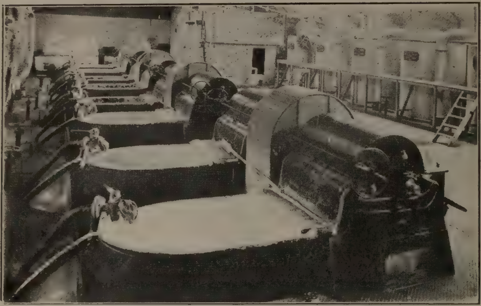

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* * *

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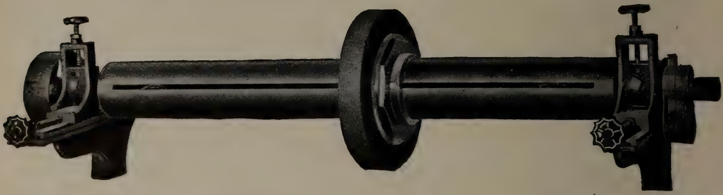

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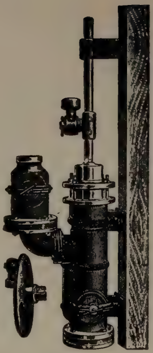

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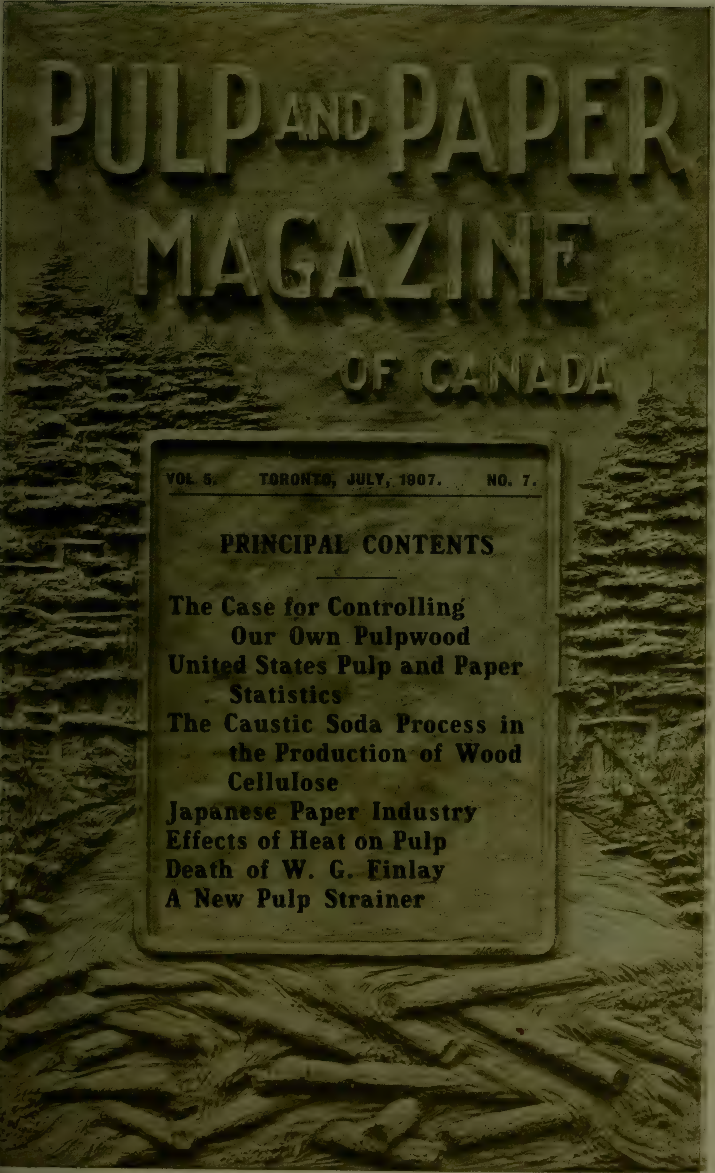

PULP AND PAPER MAGAZINE OF CANADA

VOL. 5. TORONTO, JULY, 1907. NO. 7.

PRINCIPAL CONTENTS

The Case for Controlling Our Own Pulpwood
United States Pulp and Paper Statistics
The Caustic Soda Process in the Production of Wood Cellulose
Japanese Paper Industry
Effects of Heat on Pulp
Death of W. G. Finlay
A New Pulp Strainer

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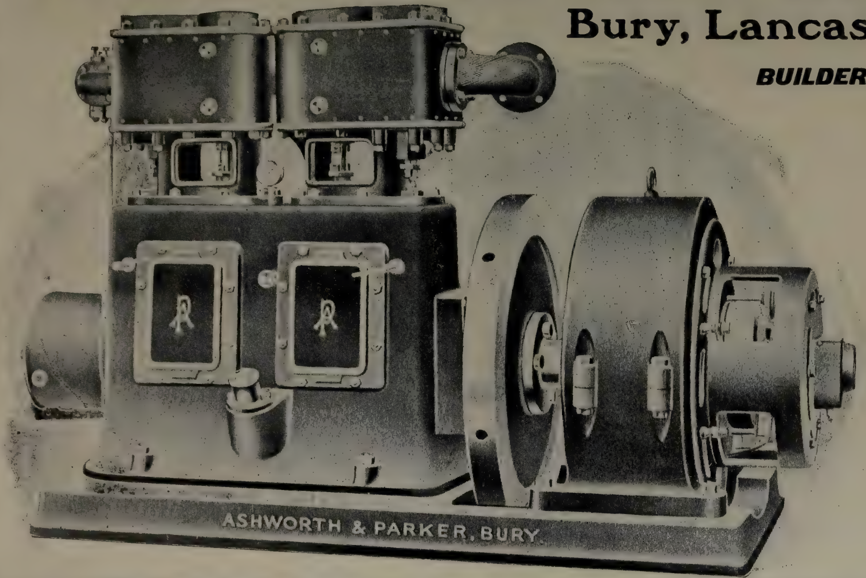

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FIRE AT DOMINION PULP MILL.

On the 19th ult. there was a fire at the Dominion Pulp Mill, Chatham, N.B., which broke out in the acid room and did considerable damage. The mill pump did good work in combating the flames, but unfortunately broke down and had it not been for the arrival of steam engines from the town the whole plant would probably have been destroyed. As it was, the acid plant was burned to the ground. It is only 18 months since it was destroyed in a similar way. The present buildings were completed a year ago in May, and the mill has been in operation but a year, and is now rendered useless again. The buildings are valued at $6,000, and with machinery and material destroyed the loss will probably reach $15,000. The insurance was about $11,000. The company was already contemplating the erection of a plant in Newfoundland, and Mr. Stevens, the mechanical superintendent, had just left for Newfoundland. The mill employs 75 to 100 hands, and its shut down at this season will be severely felt in the town.

*

Bertram's, Limited, paper mill machinists, St. Katharines Works, Sciennes, Edinburgh, Scotland, have recently issued a catalogue. It contains notes regarding their patent rope gearing for for paper making machines, in which one rope, costing say £15 to £30 drives the entire machine from breast roll to reeling gear. This is claimed to be one of the most successful features ever introduced into a paper mill. Also notes regarding patent water ejectors for vacuum boxes, which have been adopted by so many of the paper mills in Great Britain. Several other improvements and specialties are also described. The sole agents for Bertram's Ltd., in Caneers, 445 to 447 King Street West, Torada are the J. L. Morrison Co., enginonto.

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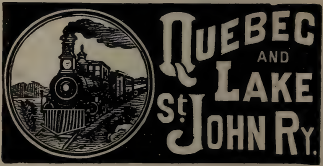

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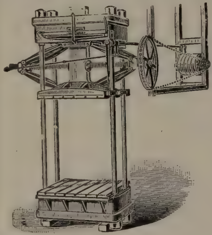

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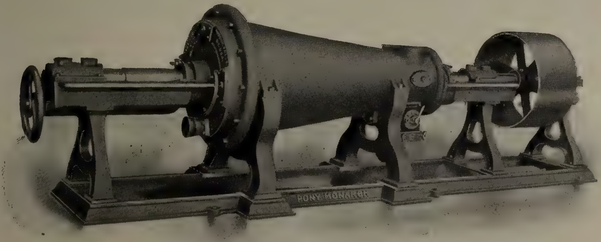

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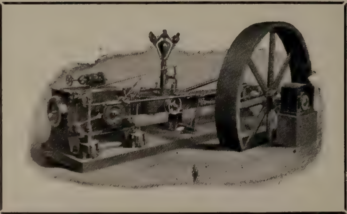

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THE
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OF CANADA

VOL. 5.—NO. 7. TORONTO, JULY, 1907. $1 A YEAR SINGLE COPY 10C

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade.

SUBSCRIPTIONS: Canada, British Empire and the United States, $1 a year; to Foreign Countries, 5s. a year.

The Pulp and Paper Magazine is published on the third Tuesday of each month. Changes of advertisements should be in the publishers' hands not later than the 10th of the month, and, where proofs are required four days earlier. Cuts should be sent by mail, not by express.

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PUBLISHERS
OFFICES, CONFEDERATION LIFE BUILDING,
TORONTO, CANADA.

THE CASE FOR CONTROLLING OUR PULP-WOOD.

The Toronto "Globe" is to be congratulated on its timely acumen in recognizing that the conservation of Canada's resources of pulp-wood is no mere academic question, but a problem for practical politics to deal with at once. But while it is a problem of acute political importance, party politics do not, need not, and must not enter into the discussion at all. This country and the United States—for the neighboring Republic is almost as much interested as we are ourselves—are up against a condition. This condition is that the stores of pulp-wood on which the paper manufacturer relies for his raw material are already exhausted in the manufacturing sections of the United States, and, unless something radical is done, and done at once, will become exhausted in Canada also. In the case of the former country, they have themselves and their prodigality largely to blame for the situation in which the pulp interests now find themselves. But in Canada the situation is even worse, because we are allowing the manufacturers of another nation, having used up their own resources, to come and take ours with no proper recompense. However, it is not especially because United States manufacturers make use of the raw materials of this country for their own benefit that Canadians object to the present state of things, and have come to the conclusion that it is time for a change. Most people who have thought out the question believe the best way to settle it is to impose a substantial export duty on pulp-wood. It is simply a measure of self-preservation that they desire; just in the same way that the United States, if they could only have foreseen the course of events, would have been glad to place some sort of a check upon the indiscriminate cutting down of their own forests in the past. And in this connection it must be remembered that there are other grave reasons for putting a stop to wastage of the forests besides those immediately connected with the manufacture of wood. Climate and agricultural success depend largely on the same point, let alone the continuance of its wealth in water power, which bids fair to make Canada one of the greatest manufacturing countries in the world.

But, of course, the main argument is of an economic character. When a cord of pulp-wood grown in Canada is cut and sent away, it is worth to this country so much. When it is cut in this country and converted into pulp, it is worth three or four times as much. When this pulp is converted into the final product—paper—there is again a greatly enhanced valuation. Under present circumstances, Canadians are parting with their raw material for almost nothing to foreign manufacturers who convert it into paper at a profit to themselves, the transportation companies, and to everybody concerned; whereas, as owners of the raw material, they ought to have the benefit. This benefit would consist not merely in profits from the pulp and paper industry, but would mean the employment of a great quantity of additional labor and the building up of the country. A practical illustration of this point can be found in the relative position of Northern Michigan and Ontario from a lumbering point of view since the prohibition of the export of lumber in the log from Crown lands.

The "Globe" is doing a good work in familiarizing the public mind with the main facts of the case. Apart from the duty of a great newspaper to keep its readers abreast of important industrial movements, publishers have a very special interest in preserving our Canadian pulp forests. Already news paper has reached such a price that it is giving rise to serious thought in those who conduct the great city dailies. This will give way to alarm if things go on much longer as they are.

UNITED STATES PULP AND PAPER STATISTICS.

Further examination of the valuable bulletin recently issued by the United States Census Bureau discloses some interesting facts regarding the development of the pulp and paper industry. The manufacture of wood pulp was introduced in the United States in 1854; the process upon which the present extensive industry is based was discovered in 1867. The manufacture first appeared as an industry in the census reports of 1870, when eight establishments were reported, with a product valued at $172,350. In 1880 there were fifty establishments reported with a product of $2,256,946. In 1890 there were eighty-two establishments with a product valued at $4,627,796. The number of paper mills has increased from 443 to 763, or 72.2 per cent. during the past fifty years, the number of wage-earners has increased from 6,785 to 49,656, or 631.8 per cent.; the total amount paid in wages from $1,497,792 to $20,746,426, or 1,285.1 per cent.; and the value of all products from $10,187,177 to $127,286,162, or 1,149.5 per cent.

The value of the product is reported at $127,286,162, to produce which involved an outlay of $4,500,911 for salaries of officers and clerks; $20,746,426 for wages paid; $10,184,106 for miscellaneous expenses, including rent, taxes, etc.; and $70,530,236 for materials used, mill supplies, freight, and fuel.

Of course, in order to arrive at an idea of the net profits of the industry, selling expenses, etc., must be deducted. But this is another story. It is not difficult, however, to make a rough guess at the position to which the sister industry in Canada might reach under a policy of fostering our own resources.

One table in the bulletin shows that, while 598,229 cords of domestic spruce, valued at $2,855,872, were consumed in the manufacture of wood pulp for the production of paper, only 134 establishments, of the total number 763 reported, consumed domestic spruce. In many mills, certain classes of materials, such as ground wood pulp, soda wood fibre, and sulphite wood fibre, are reported as purchased. The imports from Canada are a large item in these raw materials purchased.

⁂

—The Dominion Government is about to take measures to clear all squatters from its forest reserves in Manitoba, Saskatchewan, Alberta, and the railway belt of British Columbia. These reserves cover a total area of 3,300 square miles. The object of removing squatters is, of course, to lessen the chances of forest fires which have already caused so much damage. A permanent staff of reserve rangers is being organized to prevent fires and the poaching of timber.

⁂

—The French Government proposes to impose an export duty on rags, and the proposal is being opposed by British paper makers. It seems that the movement originally started owing to good, clean rags which heretofore had been obtainable by French paper makers at 3d. per cwt. having been bought up by foreigners, and the price advanced to 2s. There was a kind of famine in good rags as a consequence. It is believed by a good many that the French rag merchants, of whom there exist a large number, will have sufficient influence to defeat the proposed measure.

⁂

Canada has again distinguished herself—this time in Ireland—in the pulp industry. The occasion was the Irish International Exhibition, which has been on view in Dublin. This is what "Paper Making" has to say of Canada's exhibit:

"Canada has come out very strong on the banks of Anna Liffey. The Dominion has a large pavilion to itself, and fills it well. Vast stocks of wood, in the rough and in worked-up condition, are shown, and among them splendid specimens of the best pulp woods; spruce, balsam, poplar, and pine. A tablet makes the proud boast that "Canada can supply the world with pulp for thousands of years"! And another informs the world that "Thirty years ago pulp mills were unknown in Canada; now they represent a capital of over £20,000,000.

⁂

—Some of the large New York newspapers, influenced by the shortage of news paper, are attempting to reduce consumption by making papers purchased by agents non-returnable. The example is likely to be followed by others.

PULP AND PAPER NEWS.

Serious bush fires have taken place in the Mattawa, Parry Sound, and Temiskaming districts.

* * *

Some of the employees of the Laurentide Paper Co. struck work last month but returned after three days, pending a settlement.

* * *

The E. B. Eddy Company, Hull, Que., are now operating a plant for the manufacture of papiermache, the first of its kind in Canada.

* * *

The assets of William Hamilton Manufacturing Company, Peterborough, have been sold, we understand, to R. R. Hall, M.P., and the purchase ratified by the creditors.

* * *

Ed. Finley has resigned the position of superintendent of William Barber & Bros'. paper mill at Georgetown, Ont., and Mr. Hughes has been appointed to fill his place.

* * *

The report of the Minister of Lands, Forests and Mines shows that the total collections from all services in that department in the year ending June 30th last was $2,266,387.84.

* * *

Several thousands of cords of pulpwood belonging to the St. Anne Power Company, early this month, were carried over the booms at Grande Riviere, Que., and swept out into the St. Lawrence, but were fortunately saved near St Anne's in an eddy.

* * *

J. R. Booth, of Ottawa, has made arrangements with the Temiskaming and Northern Ontario Railway for the construction of a private siding at Latchford for the accommodation of cars to carry supplies to his pulp-wood concession on the Montreal River.

* * *

The Port Haney Brick Company, Ltd., capital $50,000, and the Graham Island Lumber Company, Ltd., capital $300,000, are two companies just incorporated under British Columbia charters, authorizing them amongst other things to build pulp mills.

* * *

The New Brunswick Publishing Company, St. John, are applying for incorporation with a capital of $80,000 for the purpose of publishing a newspaper and carrying on a general printing business. Senator Wood, of Sackville, and J. F. McKane, of Newcastle, are interested.

* * *

The Observer Printing Co., Sarnia, Ont., have been incorporated with a capital of $40,000. It will take over the "Sarnia Observer" newspaper, and carry on a printing and publishing business. The provisional directors include F. Gorman, A. K. Wanless, and N. St. Clair Gurd, all of Sarnia, Ont.

* * *

The Strong Lumber Company, Ltd., Toronto, has received a Dominion charter authorizing them to carry on a lumbering business, and to manufacture pulp-wood, pulp and paper. Those interested are Thomas F. Strong, of Ogdensburgh, N.Y.; George Gordon, of Sturgeon Falls, Ont., and H. J. Bartlett, of Orillia, Ont.

* * * *

W. H. McAuliffe and A. M. Davis, of Ottawa, have, with others, been incorporated under the name of the Chaudiere Lumber Company, for the purpose of carrying on business as lumber merchants, and to manufacture wood pulp. We are given to understand, however, that the latter branch of the enterprise will not be undertaken for a long time to come.

* * *

Some 200 old employees of the Lake Superior Corporation's pulp mill at Sault Ste Marie, who were thrown out of work as a consequence of fire a few weeks ago, have made considerable headway in clearing up the debris, and it is likely that the mill will again be in operation in a couple of months. The insurance has been adjusted saisfactorily.

* * *

The Lincoln Paper Mills Co., Merritton, Ont., have purchased the large building formerly occupied by the Canadian Colored Cottons Mills Co. at that place, and it is their intention to start another paper mill to run on wrapping and special papers.

* * *

F. W. Bird & Son, Hamilton, Ont., who built a large plant for the manufacture of roofing and building papers, contemplate erecting a paper mill there next year. At present the paper is imported from East Walpole, Mass., and finished at Hamilton, but owing to the growing importance of that trade in Canada, a paper mill is deemed a necessity.

* * *

The Temiskaming and Northern Ontario Railway Commission is negotiating with Michigan pulp mills for the carriage of pulp-wood cut by farmers along the line of the railway to Port Huron, and with other parties for the carriage of pulp-wood to the Soo mill. It is said that the Michigan people referred to are contemplating the erection of a pulp mill at Sarnia.

* * *

The Brompton Pulp and Paper Company, at their Brompton, Que., mills now have 21 grinders producing 125 tons of ground wood per day. The soda mill at East Angus, Que., is being changed over to a sulphate mill, with a capacity of 50 tons per day, and it will begin operations next month. The company has a cylinder machine for drying but will use a large portion of the product themselves, which will be pumped wet to the paper mill. They have two Fourdrinier machines.

* * *

In Toronto, on the 11th instant, judgment was reserved in a motion by A. M. Stewart, on behalf of J. P. Clement, for a declaration of the latter's rights as holder of certain debentures of the Imperial Paper Mills of Canada, and for the appointment of a receiver for the company to be discontinued. C. N. Master opposed the motion, and stated that the reorganizers of the company had had much success in their work, and had got an order from the English courts for the issue of £400,000 in bonds, as security, in priority to a second issue of £250,000. Mr. Stewart said that as claimant's bonds were of the second issue, his security was practically wiped out.

* * *

About 200 men are now employed on building up the new power plant at Fort Frances, Ont. The first plant to utilize it, it is said, will be the pulp and paper mills which are to be established there. In reference to this, the Hon. Frank Cochrane, Minister of Crown Lands in the Ontario Government, when visiting the town a few days ago said: "As to a pulp concession the Cabinet has considered it, and before long there will be an advertisement for the sale of pulp lands, with the condition that the pulp mill must be established at Fort Frances."

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Albert E. Reed & Co., Newfoundland, is the name under which has been registered in London the enterprise which we have already mentioned in these columns as being about to start a large pulp and paper enterprise in Newfoundland. The capital is placed at £400,000 in £1 shares, of which 200,000 will be preference, but there will be no initial issue. Among the first directors will be A. E. Reed, H. Holloway, C. L. Stevens, S. Cousins, A. R. Reed, and E. P. Reed.

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F. D. Small has been appointed manager of the Canadian Pacific Sulphite Co., Ltd., and will superintend the building of their sulphite plant at Swanson's Bay, B.C., work on which is now going on. He was formerly with the St. Croix Paper Co., at Woodland, Me.

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—The conventions of the International Brotherhood of Pulp, Sulphite and Paper Mill workers and the International Brotherhood of Paper Mill Workers, both took place in Northampton, Mass., on the 24th ult.

FUNCTION OF THE CAUSTIC SODA PROCESS IN THE PRODUCTION OF CELLULOSE FROM WOODS*

By J. A. De Cew, B.A.Sc.

In determining the most profitable utilisation of any raw material, the process employed in converting it into a marketable commodity must generally bear the economic responsibility. When, therefore, we consider raw products which have such a complex organic structure as is found in the various woods, the process problem becomes vastly more difficult, for many products may be made from the same source which differ widely in character and value. There are generally found certain combinations of conditions which adapt themselves to one particular process more than to another, and it is only when these conditions are realised that the process finds its real usefulness.

We have certain conditions in Canada in connection with our forest resources, to which the alkaline process of cellulose production is so well adapted, that we may safely say that in our economic development this process has a particular function to perform. This function is the production, from any woody material not sufficiently valuable to be classed as merchantable timber, of a cellulose fibre suitable for the manufacture of paper.

The discovery of methods of producing cellulose by the solvent action of certain chemicals on the vegetable fibres, produced a great advance in the paper making industry, and was really the beginning of cheap production. Cotton cellulose became very scarce owing to the increasing demand, and prices were correspondingly high, but the manufacture of wood cellulose opened up wide fields for exploitation and research, which resulted in the development of process that can now produce this material at a minimum of cost.

Prior to the year 1860, the manufacture of cellulose fibre from straw and wood had been accomplished in a more or less experimental way in Germany, by boiling these materials under pressure in solutions of caustic alkali. At approximately the date mentioned the idea took root in the United States, patents were obtained, and works were established on such a large scale as to warrant the impression that it was purely an American process.

That Canada was not far behind, however, was shown by the fact that but a year or two after the first plant was built in America, soda cellulose was being produced in connection with the plant of the present Canada Paper Company of Windsor Mills, P.Q. There was at this time a very limited demand in Canada for this material, and the endeavor was made to place it in the British market, where it was then practically unknown. Shipments of both spruce and basswood fibre were sent over, but it was with extreme difficulty that this material was sold, as the British papermaker looked on wood fibre as a rank adulteration, totally unfit for admixture with rag stock.

Some trials of it were finally made however, with marked success, and it is without doubt that, due to the progressive spirit of this pioneer among Canadian paper manufacturers, Canada may claim the distinction of being the first producer of wood cellulose for the British market.

In the early days of the process, straw cellulose was also made in various places in the United States, but a few years demonstrated that the woods were the cheaper raw material, and the cooking of the straw was abandoned. It is still, however, worked profitably in Germany, where a different relation of these values exists. In the period of 1865 to 1875 a large number of mills were erected throughout Canada and the United States, for the cooking of wood by the soda process. Then an acid process was introduced, first somewhat experimentally, and finally on a very large scale. This new process seemed to have many points of superiority over the older method and has monopolised the attention of pulp chemists for many years; but although it has escaped some of the difficulties of the soda process, it has developed others of its own.

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* Delivered before the Canadian section of the Society of Chemical Industry, Montreal, March 15th, 1907.

Both of the industries represented by these processes have since been growing side by side, until they have become highly developed and of enormous proportions, the rate of growth being largely in favor of the sulphite process. As we expect a large part of the future development to take place in Canada, and as our manufacturing conditions are considerably different from those of the other paper manufacturing States, it is more than likely that the soda process will be the most potent factor in our development.

The older or alkaline process consists in boiling wood, in the form of chips, in hot solutions of caustic soda at a high pressure. The soda contained in the waste liquors from this treatment is recovered by first concentrating the liquors by evaporation, burning off the organic matter, and causticising the remaining carbonate. In this way the process may be considered continuous, the recovery plant having already prepared the liquors for the next treatment.

In the sulphite process, however, the wood is generally boiled under pressure in a strongly acid solution consisting of acid sulphites and free sulphurous acid. At the completion of the cook, some of this free acid may be recovered, but practically all of the sulphur and the magnesium or lime from which the liquors are made, becomes a total loss. Although the cost of these liquors is less than that of the caustic soda, yet their total value is chargeable against the pulp produced, as against the cost of recovery, plus the percentage of loss in the case of the soda liquors. Again, the acidity of the liquors demands that special, acid-resisting linings must be used in the digesters, and that bronze pipings and fittings must be used for contact parts. On account of these conditions, the investment for this part of the process is much greater than is required for the alkaline liquors. The depreciation in a plant of this kind is also rapid, for the wear and tear and the cost of repairs is much higher than in the soda plant.

One distinct advantage of the sulphite liquors is due to their reducing action, by which the lignocellulose is dissolved in an almost unchanged condition, the fibres remaining quite free from colour-matter, although they are no nearer to being pure cellulose than the fibres by the other process. The use of this white unbleached fibre in the manufacture of newspapers and other grades where strength and colour are the only consideration, has thus created an enormous demand for sulphite. The sulphite process, however, has several limitations, and under many conditions can be well supplanted by the soda treatment. In the first place, sulphite pulp can only be made from clean wood, for the sulphite liquors have no dissolving action on knots, bark, resin, root, etc., and this means that only sound wood can be used, which must be very carefully prepared. On the other hand, very inferior material may be used for producing a good quality of soda fibre, as many of the impurities are dissolved in the process.

Owing to the acidity of the sulphite liquors, the small amount of combined silica present in all woods is totally unattacked, but this is completely dissolved and carried away by the soda in the alkaline treatment. This apparently insignificant fact is the cause of a distinct difference in the character of the fibre that these processes will produce, for the removal of the silica from the wood imparts to the soda fibre a soft, pliable, closely-felting nature for which it is especially valuable. Both the soda and sulphite fibre, however, must be bleached by an oxidising agent before it can be considered a pure cellulose suitable for use for fine papers, and under these conditions the two processes meet on a more even plane in regard to cost of production. We can fairly claim that the soda process, when properly established under favorable circumstances, can compete in cost of manfacture with the sulphite process in the production of bleached cellulose from the coniferous woods. This may be considered the only real point of contact of the two processes, although soda spruce fibre is still sometimes used for newspapers, for the increased value of the fibre is equalised by the small quantity required. The most important function of the soda process, however, consists in the manufacture of bleached fibre from the deciduous woods, for it is particularly adapted to these conditions, owing to the facility for production at low cost and the excellent quality of fibre obtained.

It is quite apparent that each process referred to has its own sphere of usefulness, and will consequently continue to develop in a different direction as heretofore, for the application of their products is supplementary rather than competitive. The fibres that we can obtain from the hard woods are quite different in character, being thinner and shorter, than those yielded by the conifers, and when isolated by means of soda, are so soft in texture, that they are especially valuable for the production of high grade papers of smooth surface and good finish.

Most of our Canadian or American book papers contain considerable quantities of soda poplar fibre, which serves the same purpose in American papermaking as the esparto fibre does in the English mills. It is on account of the large consumption of soda poplar for this purpose, that the soda industry in the United States is almost exclusively engaged in the treatment of poplar and other deciduous woods, for the production of this kind of fibre. This application of the process, however, has not yet been introduced into Canada, although we can offer some exceptional natural facilities; but these we will refer to again, after we have considered some of the general relationships and conditions of the cause of treatment.

The chemical reactions of the process consist, as we have already intimated, in a combination between the alkaline radicle and the more reactive portions of the wood, which, under the influence of temperature and pressure, breaks down with the formation of soluble products, and leaves the cellulose in the form of isolated fibres.

The results obtained with this process depend very largely upon the accuracy with which it is carried out. The action of the caustic soda is one of hydrolysis, in which the woody molecule is gradually broken down, with the formation of acid products, which combine with and neutralise the alkali. Now, if sufficient alkali were used, and the cooking action continued, the entire fibre would finally be dissolved, although the more resistant celluloses would be the last to disappear. It is therefore necessary, in order to bring into solution only the lignified portion of the wood, to add just sufficient alkali for this purpose. This is almost entirely neutralised by the acid products formed from the lignocellulose, and thus very little free alkali is left in the liquor to attack the rest of the fibre, which should be almost pure cellulose. At first the alkali is very active, and a rapid combination takes place, but the rate of reaction becomes continually slower, as the free alkali grows less and the resistance increases. As the actual amount of alkali required in this process varies with the kind of wood to be treated, the character of fibre to be produced, and the method of cooking, it necessarily follows that the data published by different observers is seldom in agreement.

owing to differences in conditions. If the lignified portion of any wood shows unusual resistance to the alkali, or if for any other reason a more severe treatment is employed, the excess of alkali, while breaking up the lignic molecule, will also attack and dissolve the more soluble celluloses, and the result is a smaller yield of fibre. There are also such varying conditions as to causticity, pressure, circulation, and time of cooking, which are of considerable importance in the process, for some makers are obtaining from 1–200 lb. of fibre per cord more than others, in treating the same kind of wood.

In considering the relationship of the different woods to this process, we must divide them into two general classes, for the resistance offered by the lignification of the conifers is much greater than that of the broad-leafed woods. In each of these divisions some are relatively more resistant than others, depending, no doubt, on differences in chemical structure, concerning which very little is known. We can, however, formulate a general principle applying to the woods of any particular species, to the effect that resistance to hydrolysis increases with the lignification. The amount of lignification generally depends upon the age of the tree and the rate of growth, and in this way we explain the adaptability of the younger timber to the manufacture of pulp.

It is difficult to show, from actual practice, the relative resistance offered and yield obtained from old and young woods of the same species, for these are seldom treated separately, although there would be an advantage in doing so. This may be illustrated by taking an extreme case, such as the freshly-formed wood of twigs a few months old. In this case the cellulose is in such a hydrated and soluble condition that it is very often eaten and digested by browsing animals, and would probably be also entirely dissolved if subjected to such alkaline treatment as would be required to produce cellulose from very old wood.

In the cooking of woods of different species, quite different results are also obtained, and in this connection the writer submits the following data, based on actual mill experience, showing the amount of alkali required, and the yield of pulp obtained, in treating some of our Canadian woods:—

	Soda as carbonate.	Sp. gr	Weight per cord.	Yield. Per cent.	Yield. Air dry.
Picea Nigra— Black Spruce	900 lb.	0.41	2,250 lb.	40	1,000 lb.
Tauga Canadensis— Hemlock	950 lb.	0.42	2,300 lb.	38	970 lb.
Populus Grandidentata— Poplar	800 lb.	0.43	2,350 lb.	44	1,150 lb.
Tilia Americana— Basswood	800 lb.	0.425	2,325 lb.	44	1,135 lb.
Betula Alba— White Birch	800 lb.	0.58	3,190 lb.	42	1,490 lb.
Acer Rubrum— Soft Maple	850 lb.	0.64	3,520 lb.	40	1,560 lb.
Betula Lutea— Yellow Birch	850 lb.	0.66	3,630 lb.	40	1,610 lb

The coniferous woods, such as spruce and hemlock, require a larger quantity of alkali per cord, and a longer time for cooking, while yielding a smaller quantity of pulp than is obtained from any of the broad-leaved woods. As the percentage yield does not vary greatly, the yield per cord bears a constant ratio to the specific gravity of the wood. However, the percentage yield is somewhat higher in those woods which are not too highly lignified, and which yield an easy bleaching pulp without too drastic a treatment. We see that the hard woods require even less alkali per cord than is required for spruce, that with less fixed charges as represented by chemicals and time, 50 per cent. more of cellulose fibre can be obtained from such woods as maple and birch, than from the spruce. As long, therefore, as the price per cord of these various woods remains the same, as well as the value of the pulp produced from them, it is not a difficult calculation to estimate wherein lies the greatest profit. I have made no tabulation of the time required to cook these various woods, for here there is a wide difference in practice. However, the most improved plants are now able to effect the complete resolution of the wood in a very short time. In fact any of the deciduous woods can now be reduced in about four hours, while the spruce should not require more than six or seven. With the improvements in the methods of cooking that have been developed, which enable us to get about twice the work out of a digester than was formerly obtained, a number of special advantages have been found to be the result of these quick cooks. The shorter the time the alkali is in contact with the cellulose, the higher is the yield obtained, and the sounder and stronger is the fibre. If all of the cellulose is freed from the lignin at practically the same time, the free alkali will have very little time to react on the weaker celluloses, and the fibres will not be broken or the points and serrations dissolved. Moreover, the fibres from the short cook are not hard to bleach, because the character of the cellulose is uniform. Under conditions of complete saturation with the right proportion of alkali, the lignocelluloses can be almost instantly dissolved by subjecting the material to the temperature and pressure that is ordinarily used for cooking the fibre. The writer has performed this experiment on a laboratory scale, and the fibre obtained so closely resembled the actual structure of the woody cell that hardly any cellulose could have been dissolved. In fact, the points of the fibres looked like needles under a hundred power magnification. This fact is merely mentioned in order to illustrate the trend of development in the cooking process, and the ideal conditions we wish to obtain; and we will now leave this part of the problem with a suggestion of the means with which we are striving towards this end. By removing the air from the woody cells a quick penetration can be obtained, and by the use of superheated steam the temperature and pressure are quickly applied. If now we discard the principle of diffusion and accelerate the final reaction by means of proper circulation, we may reduce to a minimum the time required in producing fibre by this process.'

While we are considering the digesting conditions, we might refer to a special industrial development in connection with this process, which is now causing considerable interest in the paper trade. A fibre with peculiar properties is obtained, by treating the spruce, pine, or similar wood with an insufficient quantity of alkali to effect a complete solution of the ligneous component. A portion of the waste liquors is used in this treatment, along with the fresh caustic employed, and after this free alkali becomes wholly combined, the coloring matter present is partially absorbed by the wood, which thus becomes a brown color. The fibres are still held together somewhat loosely by the lignocellulose that is undissolved, and are finally isolated by the mechanical action of revolving, edge-running stones. We thus obtain a mass of semi-lignified fibres in which the non-cellulose material is in a highly hydrated condition, and when these fibres become felted and fused together on the wire and dryers of the paper machine, they produce a paper of great strength, which is now widely known by the name of "Kraft."

Another phenomenon that illustrates the latent possibilities of the caustic soda treatment is the manufacture of a parchment-like paper from the pith of the cornstalk. Here we have a material with practically no fibrous structure, which after treatment with caustic soda has assumed a condition which enables the little cells to be melted together into a homogeneous mass. This condition must be somewhat similar to the mercerising action of caustic soda on cotton, and, when better understood, may have a similar revolutionary effect on the paper-making industry.

The most expensive part of the soda mill plant is the apparatus used in recovering the soda in the waste liquors, rendering it fit for subsequent operations. The efficiency and economy with which this is done has a most important bearing on the cost of production, as regarded from the standpoint of fuel, labor, and soda lost in recovery. But the amount of labor required and the soda lost are factors which depend upon a proper selection of apparatus and arrangement of plant. There is, there, fore, a large opportunity for leakage in connection with these charges, for while the best practice demands 90 per cent. recovery, some plants are known to obtain only 80 per cent., their charge for fresh soda being double what it should be.

The charge for fuel required for heating and evaporation is one of considerable importance, owing to the large amount of water that must be removed from the waste liquors. This can be largely reduced by the use of quadruple effect vacuum evaporators, in which the best type of plant will evaporate about 3.5 lb. of water per lb. of steam used. The calorific value of the organic matter combined with the wood is also utilised in the production of steam, and various devices are employed for obtaining the maximum amount of evaporation from the heat available. Nevertheless, under the present conditions of this industry, we may safely estimate that over one-half the cost of production consists in the wood used for the fibre and the fuel used in the process.

As most of the mills now in operation are not very favorably situated in this respect, the possibilities of greatly reducing this item of expense exist in the ideal conditions that are offered by the utilisation of the vast amount of woody material now going to waste in connection with the lumbering industries. All the requirements and functions of this process seem to designate that it should really be a complement of a saw mill plant, for there we have many valuable products now going to waste which can all be utilised.

The ability of this process to produce good fibre from rough, knotty, and otherwise inferior timber, which is now left in the woods or consumed in a refuse burner, will suggest a method of greatly reducing one item of the expense. Certain grades of sawdust may also be very economically employed. This is now a very pressing point with the United States mills, for there the average cost of pulp-wood alone must amount to more than $15 per ton of pulp. Moreover, if a portion of the heat energy now dissipated in the refuse burners and the exhaust steam from the mill engines were used in the concentration of the soda liquors, the total cost of recovering the alkali would be reduced to the smaller items of expense, as labor, lime loss in recovery (not over 10 per cent.), and interest on investment, and depreciation. The cost of steam for digesting and drying the pulp would also be reduced to a minimum, and we have thus presented a combination of conditions which offers a very great economy in production.

Further than this, there are locations in Canada where an excellent quality of limestone lies contiguous to the saw mill, and where water power can be obtained, and under these conditions the producer would be able to obtain the lowest possible cost of manufacture by burning his own lime and making his own caustic and bleaching liquors by the electrolytic process. It is hard to conceive of a more ideal set of conditions on which to base an industry for world competition, for here we have all of the best facilities for economic production, in the immediate vicinity of the raw material.

Are we not, therefore, confronted by a strange paradox in the realisation of the fact that our poplar wood is being shipped out of the country, being manufactured under far less favorable conditions than we have at home, and is brought back to us in the form of pulp and paper, in spite of such apparent difficulties as freight and tariff? We have reason to hope, however, that some day these conditions will be changed, and that an industry with such possibilities for our country's development will receive the consideration that it deserves.

MINERALS FOR PAPERMAKING.

The question of the use of mineral water by papermakers is now of especial importance, as improvements in machinery, and paper technics generally, as well as more exacting demands on the part of consumers, have made the older processes of practically little value.

Asbestos is the most valuable of all mineral fillings to the papermaker. With it the loss on the paper machine is less than with any other mineral, and the effect produced, especially in the manufacture of the better kinds of printing papers, is extremely good, the affinity of the paper for dyes is much increased, as well as the clearness with which the paper receives the impression of the type. It is used in combination with caustic alkali and water-glass. Unfortunately, the price of asbestos puts it out of court, except for really expensive paper. Chloride of barium is much cheaper, and answers very well. Heavy-spar, blanc fixe, and talc answer very well for thick papers, but do not give satisfactory results with the thinner kinds. Gypsum mixed with kaolin answers well for cheap printings

All minerals improve the printing qualities of a paper, and in many cases their use is indispensable. They must also be used for wall-papers and colored papers generally, except for the very best kinds.

When paper has to be heavily sized, the best quality only of a given mineral is admissible, and then not in greater amount than 10 per cent. Exactly the same is true of papers which have to be calendered. Every coarse particle in the mineral filling means a hole in the paper, and that is, of course, fatal in the case of fine papers. All wood pulps must be specially prepared for mineral filling. The fibre that holds minerals best is cotton.

Another point is that unless there are special means of dealing with the waste water from the sieves, mineral matter must be sparingly used, or much of it will be wasted. The use of starch and similar bodies to bind the minerals in the paper is expensive, and never gives really satisfactory results.

SPANISH RIVER PULP MILLS.

The deal by which the property of the Spanish River Paper & Pulp Company, at Espanola, Ont., passes into control of a Wisconsin syndicate, headed by E. A. Edmonds, of the Rhinelander Paper Company, has been put through. With Mr. Edmonds as president in the reorganization there will be his two brothers, W. L. Edmonds, of Wausau, and F. J. Edmonds, of Brokaw, but the other personnel of the company has not yet been definitely decided. We understand that A. E. Millington, the present manager of the plant, will continue in that capacity, and that all those placed in executive positions will be "men of brains, not necessarily of capital." Mr. Edmonds is very enthusiastic concerning the successful future of the enterprise. He claims, while the entire tract has never been gone over by experts, that one-fifth part of it which has been properly surveyed shows a stumpage sufficient to last from fifteen to twenty years, at a rate of consumption of 50,000 cords per year. The pulp will be used principally by three Wisconsin mills. the Falls Manufacturing Company, Oconto Falls, the Rhinelander Pulp & Paper Company, Rhinelander, and the Wausau Paper Mills, Wausau, Wis. The selling price of the property was $2,160,000, while the value of the stocks, bonds and other liabilities was $2,050,000.

JAPANESE PAPER INDUSTRY

With the awakening of the Orient and the consequent increased demand for paper, the future of the paper industry in Japan, which has already made material headway, seems to be assured. Nearly all the machinery now used in the paper mills in Japan is of American make, says Oswald White, British second assistant Consul in Japan.

The last year has shown considerable signs of activity. As a consequence the amount of capital invested has increased from under £1,000,000 to about £2,750,000. At the end of 1904 the number of machines working was 92, and the total horse-power 16,212.

The majority of Japanese mills use steam for their motive power. It appears the Japanese rivers are of little use for paper making purposes, as the volume of water, in most cases, is ridiculously small and the rivers are also liable to sudden floods. Where water is available, electricity is likely before long to take the place of the mechanical means hitherto employed. As an instance it may be mentioned that the new factory of the Oji mill in Hokkaido is to be worked by electricity. A power station is being established on the bank of the River Chitose, which forms the outlet of the Lake Ishikari. The factory itself will be established at Tomakomai, on the railway from Muroran. Various projects are under discussion to convert the force of the River Hayakawa and the River Shibakawa, two tributaries of the River Fuji, into electricity.

The report states that paper mills were first started in Japan in about 1871. At that time rags only were used; but owing to the advance in price, their place is being more and more taken by wood pulp. Although Japan has an extensive forest area, difficulties exist in meeting the requirements for the manufacture of wood pulp. For instance, the cost of transport is very great and communications are extremely difficult in many parts, owing to the mountainous character of the country and the variable nature of the rivers. Japanese forests have been much spoiled by the reckless cutting which followed the Restoration in 1868. Hitherto only ground pulp has been made in Japan, and the whole of the chemical pulp used is imported.

The imports of wood pulp into Japan has greatly increased since 1902, when the quantity was 3,500 tons, of the value of £32,000 in 1905, 10,200 tons, £107,000; and 1906, 16,700 tons, £180,000. Of the value, in 1905 Germany claimed £69,000; Norway and Sweden, £26,000; the United States, £7,000, and the United Kingdom, £5,000.

The Japanese are looking to bamboo as a possible paper making fibre. They have shown considerable interest in the report of R. W. Sindall on the value of bamboo for paper making purposes as supplied to the Indian Government. The Agricultural College, Tokio, recently announced that it has discovered a method of making pulp from bamboo grass (sasa), for which the highest results are claimed. The bamboo grass is very common in Japan and has hitherto been put to little use. It is proposed to teach the method to the Japanese farmer, and as it is hoped that pulp will be produced cheaply by it both the latter and the consumer will benefit. The whole is still under investigation, and no details are available.

Reference is made by Mr. White to import, production and export. Japanese paper mills are mainly engaged in the manufacture of printing paper and card board, these accounting for 80 per cent. of the total production. Speaking generally, it may be said that the better kinds of paper are imported, while the home factories devote their attention to the manufacture of the cheaper kinds. Even in the case of printing paper there is a considerable import. This has fluctuated a good deal, but averaged £125,000 for the five years ending 1905. In 1905, however, it was £193,000, and last year (1906) it increased still further to £232,000. The United Kingdom has hitherto supplied, roughly, one-third of this, and Belgium, roughly, one-fourth. Other countries sharing the import are Austria-Hungary, Germany, and the United States, in about equal proportions, though in 1905 the import from the United States scarcely fell short of that from the United Kingdom. The import of all kinds of paper has increased greatly in the last two years. The average for the four years ending 1904 was £426,000. In 1905 and 1906 it was £808,000 and £916,000 respectively. As to the home output, no official figures are available later than 1904, but in that year the amount of paper produced, after remaining at about £726,000 for 1900-03 increased to £1,001,000. Previous to 1900 the output averaged from £300,000 to £500,000. This is exclusive of the production of cardboard. The export from Japanese mills is small, being confined to cardboard, which goes to Shanghai and Bombay, and printing paper and other varieties, which go to China and Corea. The export (exclusive of cardboard) has averaged £41,000 for the last four years, while the export of cardboard has averaged £9,000 in the same period.

Some interesting particulars are given of the Guild of Paper Manufacturers, which was organized in 1880, the principal object being the monopoly of the market to the exclusion of the foreign importer. It hoped to attain this end by carefully watching the market, with a view to controlling prices. The guild had, besides numerous extraordinary meetings, four ordinary meetings a year, which determined the highest and lowest prices at which members could sell their goods to the trade. In addition to agreeing to abide by these prices, members pledged themselves to give one another the benefit of any special methods, not in the nature of inventions, that might be known or become known to them. An agreement was concluded with the guild of paper merchants by which the latter promised to keep the manufacturers informed as to the exact state of the market with regard to foreign orders, and, as far as possible, favor the Japanese manufacturer as against the foreign. By means of the information received from the merchants' guild, the manufacturers' guild hoped to constantly undersell the merchants of foreign countries in Japanese markets. Experience soon showed the inefficiency of such methods, and in 1883 the guild decided to abandon its idea of arbitrarily fixing the lowest limit of prices. Several companies, disappointed that the guild had been unable to accomplish its object, resigned their connection, and only three companies remained in the guild. The guild had only just recognized the futility of fighting foreign competition by the methods it had hitherto adopted when a fresh competitor appeared on the scene. The Insatsukyoku had at first devoted its attention mainly to manufacturing paper needed for official purposes; it now commenced to make ordinary printing paper and sell it on the market. It was claimed by the manufacturers that the Insatsukyoku, having its running expenses paid by the government, enjoyed an unfair advantage, and that they were unable to compete. The guild repeatedly represented these facts to the government, but without result, and the Insatsukyoku has continued the manufacture. The guild now represents nearly the whole of the paper manufacturers in the country. When the tariff was being revised the guild had to combat a proposal made by the proprietors of certain Japanese newspapers that the import duty on printing paper should be greatly lessened. It was finally fixed at (1) weighing not more than 48 pound per 500 sheets and measuring not less than 1,086 square inches per sheet, 1 yen about (2s. 0½d.) per 100 kin (about 133 pounds); and (2) all other kinds, 1.950 yen (about 4s.) per 100 kin. The previous duty was 1.569 yen (about 3s. 2½d.) on all kinds. The Conventional tariff is (1), weighing not more than 24 pounds per ream of 500 sheets and measuring not less than 1,086 square inches per sheet, 0.800 yen (about 1s. 7½d.); and (2) all other kinds, 1.163 yen (about 2s. 4½d.).

Mr. White concludes his report with the following words: "The Japanese paper industry has made but slow progress since its commencement. In the beginning, doubtless, want of experience must have accounted for this; but the chief difficulty has been dearness of material. At present the industry is not without promise. Should the scheme for manufacturing pulp out of bamboo grass mature, the main obstacle in the way of progress will be removed. Much, again, is expected of Hokkaido; if it fulfils all that is claimed for it, a source of supply of material for many years will be obtained. The paper industry has certainly had a good deal of life infused into it during the last year; but one cannot help wondering whether it is not being overdone. A change from £1,000,000 to close on £3,000,000 invested is a very great one. The Japanese market alone would scarcely seem sufficient to make it profitable, and Japan is far from being in a position to export. But, however, events may turn out, it is certain that the Japanese manufacturer aims at monopolizing the home market to the exclusion of the foreign importer."

A LONDON VIEW OF THE IMPERIAL PAPER MILLS.

The "London Financier" has an article on the financial position of the Imperial Paper Mills of Canada, as follows:—

In considering the value of the first and second debentures of the Imperial Paper Mills of Canada, perhaps the most important points to bear in mind are the amount of prior lien obligations in front of them, the prospect of the new bonds being placed on the market, either by instalments or en bloc, and the relation of the aggregate bond issue to the actual earning capacity of the mills. Regarding the last bond issue, sanctioned on April 8, I am informed by an official of the company that the capitalists in Canada who provide the funds are as thoroughly convinced of the soundness of the undertaking from their point of view as they were when they advanced the money, and that as matters are proceeding there is no probability of the bonds being offered on the market, or of any difficulty arising with respect to the payment of interest. Concerning the business now being carried on, it may be mentioned that the mills are in full work, with an output up to their full capacity as the plant now stands. A conservative estimate of the total annual production of paper on the present basis is 12,000 tons. On the average, it is stated officially, the price now obtained is round about $38. At this price it is estimated that the gross profit will work out at nearly, if not quite, $10 a ton. It will be understood that this 12,000 ton output is effected with quite a small plant, as compared with the capacity of the mills when the whole sulphide equipment on order is in place and at work. Looking at the past history of the company, it is not thought advisable to be in any hurry to complete the contemplated plant, and it will probably be at least twelve months before it will be in position. Meanwhile, the company has orders on hand which will keep the mills fully going on the present basis until the end of the year. It is difficult to say what the course of the market in paper will be in Canada, but, subject to such inevitable fluctuations as may be expected, the trend of prices is more likely to be up than down during this year. And with respect to the less immediate future, it may be taken as certain that lumber in North America, as well as paper, will fetch a higher price as the gradual exhaustion of the forests uninterruptedly proceeds.

THE EFFECTS OF HEAT ON PULP

Dr. Carl Hofmann, as a result of investigations into the effect of heat in drying, comes to the conclusion that up to 90 degrees no important decomposition of the fibres takes place.

In the course of a paper read by him at a meeting of the Society of Cellstuff and Paper Chemists, he said:

In the course of my investigation as to whether any chemical change takes place in the formation of pergamyn I discovered, besides the distinctive hydrolyses of sulphite pulp and of the pergamyn pulp obtained from it, a number of other hydrolyses in exactly the same manner. I then noticed that the yield of sugar was increased in proportion to the reduction in loss of weight during four hours' drying at 100° C. (212° Fahr.). As I had taken into account the proportion of water in the wet pulp as well as the H_2SO_4 at 6 per cent. used for the hydrolysis, I immediately thought that the lower yield of sugar arose from the fact that the acid penetrated less into the wet than into the dry mass, and therefore did not act so powerfully. When I, however, made the experiment upon sulphite pulp fully dried at 100° C. (212° Fahr.) of the test which I had applied to sulphite pulp, first fully dried and then heavily saturated with water, I came to the conclusion that sulphite pulp undergoes in drying a chemical change which renders it more easily subject to the effects of acids. This was confirmed by the fact that wet sulphite pulp which I had already exposed for twenty-four hours in a cold location, to the influence of acid, and which I then treated further under heat (so that the acid might have time to penetrate), gave the same limited yield as wet pulp which I had at once treated under heat.

My next step was a systematic investigation of the question. I first produced material as uniform as possible for the purpose of testing. I cut sulphite pulp into small pieces, ground it fine in a mill and spread it out in the air to dry. After some days I weighed off in closed glasses four samples, each of 6.25 grams (0.22 ounce), placed two of them aside, dried the other two during four hours at 100° C. (212 Fahr.), and hydrolyzed all the four simultaneously during six hours with 100 cubic centimetres (6.2 cubic inches) of H_2SO_4 at 6 per cent. To both the dried samples I added enough water to make up for the weight lost in drying. The tests for sugar I carried out as above. The samples dried by heat yielded considerably more sugar than those dried by air, having thus undergone a chemical change. In order to prove that this change was caused by drying at a high temperature and hydrolyzed, close to each other, air dried sulphite pulp and some more which I had dried, first in the vacuum drier for three days over H_2SO_4, and then, until constancy of weight was attained, over phosphoric pentoside. The result showed no difference between the two pulps in yield of sugar, this being a proof that drying at the temperature of a room does not change the pulp.

In the same manner as the Mitscherlich sulphite pulp I then examined other paper pulps, Ritter-Kellner sulphite pulp and old "Makulatur," from the year 1833. In both of these the result was the same. Drying at 100° C. (212° Fahr.) effected a chemical change in them. It was now a question of determining at what temperature decomposition of the sulphite pulp sets in and how high the temperature may be brought without the pulp suffering injury. I carried out these investigations by hydrolyzing close to each other pulps which I had dried in the air for equal periods at 70° C. (158° Fahr.), 80° C. (176° Fahr.), 90° C. (194° Fahr.), 100° C. (212° Fahr.), 130° C. (266° Fahr.), and 160° C. (320° Fahr.). I verified the results of the experiments by repeating the tests as often as possible; then taking the average of all the figures I had obtained at the various drying temperatures.

Results showed that up to 90° C. (194° Fahr.) no important decomposition takes place, that between 90° C. and 100° C. (194° Fahr. and 212° Fahr.) it is very decided, and that above the last named temperature it steadily continues to increase. The difference between the loss of weight on pulp dried at 90° C. (194° Fahr.) and 100° C. (212° Fahr.) varies, according to the pulps tested, between one-half per cent. and two per cent., the same remark applying to the yield of sugar.

Some of the results obtained follow:—

Kind of Drying.	Loss in Drying Per cent.	Dextrose Per cent.
Dried at 100° C. (212° Fahr.)	9.63	10.32
Dried at 100° C. (212° Fahr.)	9.60	9.06
Dried at 100° C. (212° Fahr.)	9.57	9.01
Dried at 100° C. (212° Fahr.)	9.48	9.90
Dried at 100° C. (212° Fahr.)	9.37	10.07
Dried at 90° C. (194° Fahr.)	7.39	6.58
Dried at 90° C. (194° Fahr.)	6.82	7.98
Dried at 80° C. (176° Fahr.)	8.64	7.53
Dried at 100° C. (212° Fahr.)	8.64	7.33
Dried at 100° C. (212° Fahr.)	8.03	8.07
Dried at 100° C. (212° Fahr.)	7.81	8.11
Air dried pulp....................		7.65
Air dried pulp....................		8.17

Moreover, decomposition increases with the duration of the exposure to heat. This became evident when I successively hydrolyzed samples which I had dried at the temperature of 100° C. (212° Fahr.) for four, eight, and twelve hours, respectively. The losses of weight shown at four hours and eight hours varied about one-half per cent., and the yield on sugar about the same. The following results illustrate this point:—

Kind of Drying.	Loss in Drying, Per cent.	Dextrose, Per cent.
Dried 4 hours....	12.30	6.29
Dried 4 hours....	12.52	6.40
Dried 8 hours....	12.83	6.78
Dried 8 hours....	13.07	6.94
Dried 12 hours....	11.99	7.57
Dried 12 hours....	13.08	7.55

In all the hydrolyses I had used Erlenmeyer alembics, closed with cork stopper provided with an upper tube. In order to meet the objection that during the hydrolysis substances may perhaps pass through the corks which may influence the result, I repeated the series of trials with glass alembics, in the neck of which a lid was inserted to which the upper tube was welded. The result fully confirmed the points I had previously established.

With a view to a closer investigation of the kind of decomposition, I now undertook to extract sugar from pulp dried at 130° C. (266° Fahr.). I had previously obtained xylose from sulphite pulp, and it was important to see whether the decomposed pulp yielded a different sugar. In drying the necessary large quantity of sulphite pulp I met with difficulties. If I, for instance, heated the whole quantity at once in pieces laid above each other in the drying room at 130° C. (266° Fahr.), the mass got so hot that at the opening of the room it burst into flames by spontaneous combustion. I therefore dried several smaller portions and provided, by the right arrangement of layers, for the introduction of sufficient oxygen. The sugar I extracted in the same manner as described with regard to pergamyn pulp. I succeeded in recovering xylose, but much more easily than before, a proof that sulphite pulp is rendered by drying more susceptible to acids.

As the last stage in my work regarding the change in cellstuff through drying, I further investigated the question whether other kinds of cellulose show the same results as sulphite pulp. I was able to establish the fact that straw, wood and rye, when dried at 100° C. (212° Fahr.), undergo no chemical change. The results of this work are as follows:

1st. Sulphite pulp and paper are chemically changed through being dried at a high temperature.

2nd. Decomposition begins at 90° C. (194° Fahr.), considerably increases above 100° (212° Fahr.), and is dependent upon the degree and duration of the heating.

3rd. Decomposition renders the pulp more susceptible to acids, but the same sugar can be recovered (xylose) as from sulphite pulp.

4th. Straw, wood and rye are not yet changed at 100° C. (212° Fahr.).

PAINTED PAPER FOR CHINA.

The Chinese lay great stress on writing paper having great absorbent power, as they write with a brush, and not with a pen. Large quantities of painted writing paper are at present exported to China, and its manufacture forms the subject of the present article. It consists of about 35 per cent. of rags and the remainder of wood pulp. It is usually filled with kaolin, but this mineral is best omitted, unless it is absolutely free from sand. As the paper must not weigh more than 30 grammes or 40 grammes per square metre, even the finest grain of sand will not only affect the uniformity of the color but may not improbably cause a hole like the prick of a pin in the paper. Another and most important matter is the sizing of the paper. Inasmuch as the paper has to be very light, it is impossible to use much size, and, nevertheless, the size must prevent the color from sinking through the fabric. The size must, therefore, be of the very best quality. The following method can be recommended for testing the size used in a paper:—Place a drop of phlenolpthalein on one side of the paper and a drop of caustic soda exactly opposite to it on the other side, and note how many seconds elapse before the indicator is reddened by the caustic alkali penetrating the paper. The phenolphthalein solution should be made by dissolving 5 grammes of the reagent in 10 cc. of alcohol, and diluting the solution with forty times its volume of water. The caustic soda solution is made of 1 per cent. strength. The average time required for the reddening of the phenolphthtalein is from 15 secs. to 30 secs. The number of seconds may be called the absolute sizing (X). It is evident, however, that a thick, badly-sized paper may be longer in showing the reaction than a very thin but better sized paper. Hence another datum is required, which may be called the relative sizing (Y), and is got by dividing the absolute number by the weight in grammes of a square metre of the paper. X should never for writing papers fall below 20, except in very special cases. If the absolute sizing is below 20, the paper is unsuitable for writing purposes. For good letter-paper, X should be 30, or even 40. For filter or blotting paper, of course, the smaller X is the better. It should never exceed 1. The following figures will give a good idea of the proper values, on the average, of various sorts of paper:—

Weights in grammes per sq. metre.		X.	Y.
Ordinary news	48	8	0.106
Ordinary office paper	80	15	0.189
Good printing........	103	22	0.213
Ordinary printing.....	75	17	0.226
Best letter paper.....	60	20	0.339
Fine office paper.....	110	45	0.4
Painted paper........	32	15	0.469

BARLEY STRAW FOR PAPER MAKING.

The use of barley straw for white pulp is rare, although it is cheap, easily pulped, and very suitable, not only by itself for coarse papers but as an addition to other fibres of middle class and even for fine papers, provided the barley straw is not added in too large a percentage. In the French colonies of Tunisia and Algeria barley is cultivated on a large scale and no proper utilisation of the straw has hitherto been possible, seeing that it finds a meagre market at 5s. per ton. If it were used for paper making it would give a good pulp containing up to 40 per cent. of practicable cellulose. Some samples give 56 per cent. of cellulose, but in that case the extra amount will not felt, so that it is out of court as regards the paper manufacturer. The mean length of the washed fibres is fifteen hundredths of a millimetre, and the mean thickness twelve thousandths of a millimetre. The fibres are silky and much resemble esparto.

The pulp is easily refined and is made very fat by prolonged beating. The treatment of the barley fibre, too, is nearly the same as that of esparto, as can be easily seen from the following analysis which shows clearly the close analogy between barley straw and esparto as regards chemical composition:

	African alfa (Hugo Muller)	Barley straw (H. de Montesous)
Cellulose	45.8	52.0
Fat and wax..	2.62	1.6
Aqueous extract	9.81	2.07
Pectic bodies..	29.3	29.48
Water	8.8	8.2
Ash	3.67	6.65

These figures add up with a suspicious accuracy, says "Moniteur de la Papeterie," but they are probably not far out. As regards the treatment of barley straw for pulping purposes, it must not be forgotten that it is more refractory than alfa and requires stronger lye, and also either longer boiling or boiling under a higher pressure than is required for esparto. The barley pulp bleaches well, but like alfa it never loses a pale cream tinge. This is due to the soda used, as it is present in pulps made with wood as well as those prepared from esparto or straw.

TESTING PAPER FOR WOOD PULP.

It is often difficult to discover whether wood pulp has or has not been used in the manufacture of a given paper, especially if the paper has been dyed with metaniline yellow. The presence of this dye interferes with the fluorescine test for wood pulp, for the test has to be carried out in acid liquids, and these liquids give to the metaniline dye a violet hue so intense as to mask completely any other color which may be present. A better test, which, however, requires careful handling, is dimethylparaphenylenediamine, which gives a red color with wood pulp. It must be remembered that this reagent is very unstable, and forms a red of its own on decomposition. Oxides are not usually met with in paper, but free chlorine left from bleaching processes is not uncommon. When the red color is due to the presence of wood pulp its formation is not immediate and its full development requires a minute or two. Again, the red mark on the paper becomes a dark orange on drying, and then turns to crimson if wetted again. If the paper submitted to this reagent has been dyed with metaniline yellow, the color produced in the presence of wood pulp is a violent red, but if the mark on this paper is wetted the original color of the metaniline yellow reappears. If the paper retains traces of chlorine a red mark may be formed in any case. If the red color is destroyed by ammonia but reappears on the addition of glacial acetic acid, the presence of wood pulp may be safely inferred, and its absence may be safely inferred if the acid does not restore the color.

DRY SUCTION.

In certain continuous paper-making machines the suction boxes work by means of a fall of water produced by a syphon. The air and water leave the box together by the syphon. The case is the same when a stronger aspiration is effected by air pumps or injectors. The air and water leave the box for the pump by the same pipe. The result is that the water is dirtied by oil, and forms an emulsion with the air, which makes foam stains on the paper. This is why makers prefer to waste the water which flows from the suction boxes, although both pulp and size would be saved if the water was purified, as it carries off not only the oil but the best and finest of the fibres. To prevent the dirtying of the water and the consequent frothing, attempts have been already made to extract the air separately; but even when the water and air are extracted by different pumps the water is not kept quite clean, and it is expensive and inconvenient to have a double set of pumps.

The latest system is to remove the water with a syphon and the air by a pump, says R. Kron in "Revue de la Papeterie." The two are then kept quite separate, and the water is not contaminated. Thus in the case of a continuous machine with three suction boxes the three outflow pipes open into one wide main, which is horizontal or slightly inclined. The air goes into the upper half of this main, the water into the lower. The main is connected with a vertical pipe, and the part of this which is above the main serves as an air-chamber, and is connected with a pump which sucks out the air. The water flows into the lower part of the vertical pipe, and therefore never comes into contact with the pump. This method has the following advantages:—

1. The water is clean, and ready for use again.
2. The water is not diluted by additional water.
3. The aspirator does not get dirty.
4. The action is more regular, and independent of the flow of water.

* * *

—A dispatch from Milwaukee says that manufatcturers of print and other classes of first-class paper in Wisconsin, embracing some 25 large mills, will shortly from one of the largest owning and operating paper manufacturing syndicates in the country. The plan means a manufacturing and owning company similar to the International Harvester Company.

DEATH OF W. G. FINLAY.

W. G. Finlay, president and manager of the Montrose Paper Mills, Thorold, Ont., died at St. Catharine's on the 3rd inst., as a result of a paralytic stroke which seized him during a lawn bowling tournament at Lorne Park, on Dominion Day. He was a native of Edinburgh, Scotland, and came to the United States about twenty-five years ago. Ever since his arrival on this continent he has been identified with the paper industry, and was connected with some of the largest mills, not only in this country but in the United States as well. He was the founder of the Kinleith Paper Mills, St. Catharine's, as well as of the Montrose Mills at Thorold. Mr. Finlay was very popular owing to his genial disposition. He was an enthusiastic lawn bowler, and is looked on as the father of bowling in St. Catharine's. He leaves a widow, a daughter, and two sons, Richard and Harold. He also leaves two brothers, Edward, of Georgetown, and James D. of Jolliete, P.Q.

The Late W. G. Finlay.

CANADIAN PULP-WOOD IN WISCONSIN.

Canadian pulp-wood is beginning to arrive at Green Bay, Wis., to which port it is carried by steamer and thence transferred to cars and distributed to the various paper mill centers of the Fox River Valley. Last week two steamers, the " India " and " Bermuda," arrived at Green Bay; the former, which hails from Kingston, Canada, carrying 1,000 cords and the latter 980 cords of pulpwood. During the season it is expected that no less than 15,000 cords will be shipped to Green Bay in this manner, and it is expected that about 1,200 cars will be loaded at Green Bay with wood to be shipped throughout the valley. Wisconsin River points also will receive a portion of the wood, the first consignment for these points having been shipped Saturday.—Correspondence of the Paper Mill.

* * *

SPECIAL NUMBER OF PAPIER FABRICANT.

We have received a copy of the special number of the " Papier Fabricant," issued to celebrate the annual meetings last month of the German Paper Manufacturers Association, the German Cellstuff Manufacturers and the Paper Makers' Trade Guild. It is entitled the " Festival and Foreign Number," and contains nearly 250 pages. The above-named conventions are fully reported, besides which there are some valuable papers on " Investigations as to the chemical processes in Bleaching,' by W. Ebert and J. Nussbaum; " Polarization and Dichroismus," by E. L. Sellega; " New Experiences in the Drying of Paper," by J. P. Korschelgen; " Important Fibres of Tropical Lands," etc. etc. There are several good illustrations of machinery.

INFLUENCE OF MANUFACTURING PROCESSES ON PAPER.

That the same kind of raw material may give rise to quite different varieties of finished paper is shown by work done in the Royal Technical Laboratory at Berlin, Germany.

The paper in question was wrapping paper, and the two lots may be designated as A and B. The difference in the manufacture was that with A the raw material was much more thoroughly disintegrated than in the case of B. A was only slightly pressed, B heavily, so that there was more felting of the fibres with B than with A. The tests for strength of the two papers give the results shown in the following table:—

	Stress along the fibres		Stress across the fibres		
	Tearing Length, Metres.	Stretch per cent.	Tearing Length metre.	Stretch per cent.	Weight per sq. metre. Grammes.
A	5,200	3.1	2,500	8.1	155
B	7,660	3.0	5,400	7.8	140

The " tearing length " is derived from the following formula:—Tearing weight

$$= \frac{1,000x}{ab}$$

when x is the breaking weight of a strip of paper in grammes, a the the weight of the paper in grammes per square metre, and b the width of the strip of paper tested in millimetres. The figures show that the manufacturing method has a great effect upon the tearing length, but not on the elasticity.

* * *

—T. J. Marshall & Co., Stoke Newington, London, exhibited at the recent Manchester Printing Exhibition several specialties interesting to paper-makers and others. These included their famous miniature paper-making machine and a new calculating machine, useful to all classes of business men who need rapid figuring.

PAPER-MAKERS' DIRECTORY OF ALL NATIONS.

The 16th edition of the "Paper-makers' Directory of All Nations" for the year 1907 is to hand and presents an excellent appearance, both in completeness of contents and in general appearance. A very useful feature is a "Classified List of Commercial Prospectuses," forming a complete buyer's guide for paper, pulp and board mills, and enabling them to get into direct touch with engineers, belt machinery manufacturers, boiler-makers, paper bag-makers, cardboard and paper box manufacturers, chemical and color manufacturers, china clay and fibre merchants, exporters, paper merchants, wholesale stationers, mill representatives, printers and newspaper offices, rag merchants, dealers in waste paper and paper stock, dandy roll-makers, manufacturers of felt and paper machine wire, etc. While the British paper industry has not progressed in recent years so rapidly as it might, there are several countries in which great activity prevails,—for example, in Norway and Sweden, and in Canada, and a book such as this, which places particulars of all in a handy shape should be valuable. It is published by Dean & Son, Limited, 160a Fleet St., London, E.C., England.

THE PAPER MARKET.

Paper stock is extremely firm and one mill has just advanced prices for book 25 to 50c. per 100 pounds. News is also very strong, roll being quoted at $2.35 and sheet at $2.75 with a strong tendency upward. Wrappings also incline up. The high cost of pulp and of labor is the chief reason of course for the advance.

TRADE ENQUIRIES.

The following enquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these enquiries, with their addresses, can be obtained upon application to Superintendent of Commercial Agencies, Department of Trade and Commerce, Ottawa, or publishers "Pulp and Paper Magazine":—

656. **Pulp-board Partitioning.**—A firm of egg importers in the north of England desires to get in touch with Canadian manufacturers of the pulp-board partitioning used by egg shippers.

674. **Woodworking Machinery.** — A Bristol manufacturer of woodworking machinery would like to obtain a share of Canadian trade.

⁂

—The Calgary "News" says the foothills of the Rocky Mountains in Alberta are a desirable location for manufacturing paper. With spruce forests within easy reach, power in profusion, and a market on every hand, the establishment of pulp mills and paper factories in Calgary would be a success from the start.

⁂

—In a letter from T. J. Marshall & Co., Dandy Roll Makers, Stoke Newington, London, Eng., they inform us that business is pretty good, and they have received numbers of enquiries for their miniature paper making machines. When this plant becomes better known, they will no doubt be full with orders.

⁂

—Ottawa city council is making an investigation into the source of sawdust, which is still falling into the Chaudiere River, to the annoyance of fishermen and boatmen. The pulp mills are interested, but claim they have taken every possible precaution by means of chutes and automatic carriers to avoid the dropping of refuse into the stream.

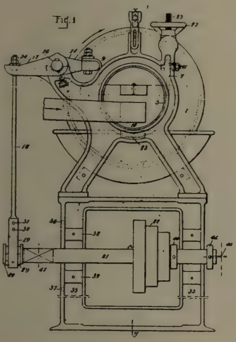
⁂

—A new process for making paper out of cornstalks has been invented by a German engineer named Drewsen, of Berlin. It provides for the removal of the outside covering and the making of the marrow into a pulp, with which paper of the finest quality is said to be manufactured at a cost much lower than the wood pulp process at present in use.

A NEW PULP STRAINER.

Marcel Lamort, of Paris, France, has been granted a patent on a means for controlling the pulp-strainer drums of paper-making machines.

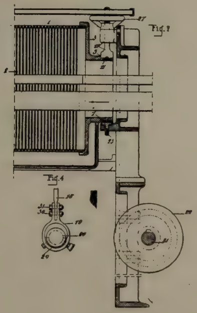
The invention relates to improved means for controlling the pulp-strainer drums of paper-making machines whereby two movements can be communicated to them, one a shaking or shogging movement, which imparts to the drum a displacement of a few millimetres in the vertical direction, the other a rotary movement, a consequence of the first, which imparts to the drum a very slow rotary movement of only a few revolutions per minute.



The drawings represent, Fig. 1, an end view of an ordinary pulp-strainer drum of a paper-making machine provided with the controlling means forming the subject of the present invention; Fig. 2, an elevation of the same, partly in longitudinal section, taken on the line **x y** of Fig. 1; Fig. 3, a plan of the same, partly broken away; and Fig. 4, a detail of one of the devices serving for working the machine.

The same reference numerals indicate like parts throughout the figures.

1 is a pulp-strainer drum consisting, as usual, of a jacket or casing 2, supported at its ends by two metal heads 3 4, each having a flange 5 6, similar to the rim of a pulley—that is to say, each is capable of receiving a strap 7 8, placed as shown at 9 10 11, and the points of attachment 11 12, of which are constituted by means of feet forming grippers.



At 9 13 the straps are connected to the ends of two iron arms 14 15, both of which are keyed on a shaft 16. By causing the ends of these arms 14 15, pivoted on the shaft 16, to rise and fall, a reciprocating movement is imparted to the drum 1 in the vertical direction. This movement is obtained in a continuous and rapid manner by employing a third lever 17, one end of which is keyed to the shaft 16, while its other or free end serves as a fulcrum or bearing for a vertical connecting-rod 18, which is itself connected at its lower end to a head 19, which pulls on an eccentric 20, forming part of a driving-shaft 21, which is set in motion by means of a belt passing over a stepped pulley 22, thereby enabling the speed to be varied at will, so as to obtain a number, also variable, of shakings or shoggings of the drum. These shakings or shoggings are rendered sharper and more energetic by the addition on each side of the drum of metallic stops or abutments 23, placed immediately below each strap. As these stops or abutments are fixed and as the straps are capable of extension the feet 11 12 are not fixed, but are each connected to a screw-rod 25 26, capable of being raised or lowered by means of a hand-wheel 27 28, forming a nut. The travel of the drum can, therefore, be regulated by causing it to fall from a greater or less height back on to the stops or abutments, thereby obtaining all the desired effects, viz., beatings without shock, beatings with shock, strong or weak, or even immobility.

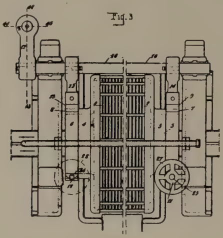


Fig. 3

The rotary movement of the drum is effected intermittently each time this latter is raised by the two straps. It is, however, the consequence of this rising movement, and can, in fact, only take place as long as the straps are drawn by one end only, because if they were drawn by both their ends the drum would always fall back to the same place and there would be no rotary movement. This movement is, moreover, proportional to the number of beats and their amplitude.

The head 19, Figs. 1 and 4, which constitutes one of the essential parts for transmitting the movement from the shaft 21 to the lever 17, consists of a cast-steel collar in which is located a brass half-bearing 29, on which the whole of the pressure due to the weight of the drum is exerted when this latter is raised. Said collar is secured to the connecting-rod 18 by bolts 30 31. At its upper end the connecting-rod 18 is jointed to the lever 17 by means of a hemispherical brass piece 34, traversed by the connecting-rod, which is screw-threaded at its end and is held by means of a nut and a lock-nut. The piece 34 rests in a recess formed in the end of the lever 17, which is bored to allow the connecting-rod 18 to pass through.

The shaft 21 is carried in two plummer-blocks, one of which is placed on the side at 47 and carries two pairs of bearing-blocks fixed on the two faces of the frame 35 at 36 37 38 39. The other, also fixed on the frame, sustains the displacements of the shaft through the intervention of the rings 40 and 41.

The shaft 21 may be placed in the direction of the axis 42 43 or in the direction of the axis 44 45. In this case it is carried in two plummer-blocks resting on iron chairs.

When two strainers are arranged tandem, the shaft 21 may be replaced by a shaft carrying two eccentrics at 20 and 46.

BLEACHING WOOD PULP.

Wood pulp (apart from the question of its quality) is the crudest form of cell-stuff fibre, its manufacture having required, in addition to water, only a relatively coarse form of preparation without the general use of special chemicals. The fibre of the wood in its natural state is brittle, and it is clear that the process to which it is usually subjected does not alter its character. He claims, however, that the inferior quality of this fibre is susceptible of methodical improvement, particularly by means of the use of warm or hot water or of steam in connection with the grinding; the improvement being progressive, according to whether steam under pressure is used; whether the treatment is direct with water and steam, or whether boiling takes place either with water or a water solution of lye. This only extends to the point of the mechanical pulverization of a ligneous material saturated by boiling with a watery lye solution as usual or the systematic production of cellulose.

Among other principles laid down by Herr Ebert, he urges that under no circumstances should there be any deterioration of the quality of the ground wood, nor should any further impurities be added. Any further treatment should be free from too many complications, and should not require extensive apparatus or numerous manipulations. The cost of any such treatment should not be such as to affect the consumption of the article. There should also be no loss in fibre, which would increase the cost of the product. In fact, the value of any process would depend on its either making a perfectly white product at a relatively small cost or on its so improving the quality of the material as to cover at least the extra cost of the process.

This would imply such an improvement in the pulp that the qualities of the fibrous mixture in its finished state should approach as nearly as possible the characteristic features of pine-wood cellstuff as to whiteness, relative freedom from encrusting substances, strength, suppleness, and extension of the cells. The production of paper similar to that made from the latter should be possible without the need of adding any important quantity of cellulose. This is considered by Herr Ebert as the only way to make any progress in the solution of the much discussed problem. The first requirement would seem to be the choice of such a description of material as would in its fibrous qualities resemble pine-wood cellstuff, and would thus afford prospects of a satisfactory result.

⁂

BLEACHING IN THE BEATER.

Proceeding on the principle that a very dense pulp requires less chlorine to bleach it when it is subjected to friction, Korschilgen and Selleger, in their "Technique de la Fabrication du Papier," suggest that certain pulps should be bleached in the beater. The beating engine exerts severe friction, which brings the impurities thoroughly into contact with the chlorine, thereby facilitating their destruction; but, on the other hand, the action is lessened by the dilution of the pulp. Ordinary breakers used for bleaching work with a pulp containing only from 3 per cent. to 4 per cent. of dry stuff, although some new types work with an 8 per cent. to 10 per cent. pulp. It is now proposed to bleach in the beater, using a pulp containing from 20 per cent. to 30 per cent. of dry stuff. The result is an excellent bleach, and a great saving of chlorine, provided that the pulp has been centrifuged so as not to contain more than 80 per cent. of water. Under these circumstances a pound of good bleaching powder in clear solution is often enough for 100 lb. of pulp. Wood pulp insufficiently scoured is difficult to bleach with chlorine. It must in the beater be first treated with bisulphite. This treatment will be sufficient of itself for common papers. As with chlorine, the penetration of the bleaching agent is greatly facilitated by the fibres being disintegrated in actual contact with it.

Even after half an hour in the beater the effect of the chlorine is manifest, as none of it is wasted. In fact, the pulp leaves the machine practically free from uncombined chlorine. The last traces are removed with a little hyposulphite of soda, or, better, by allowing the pulp to drain for a day or two, by which means the bleaching is made still more thorough, as the chlorine is then used up entirely. If time does not permit of this draining, the hyposulphite is used. If it is possible to use hot water in the beater the bleaching is accelerated, and neither draining nor the use of hyposulphite is required.

To bleach half a ton of pulp the usual amount of bleach required in the beater is about 11 lb. of dry bleach, or, say, 22 gal. at 4 deg. B. This solution should contain nearly 4 lb. of effective chlorine.

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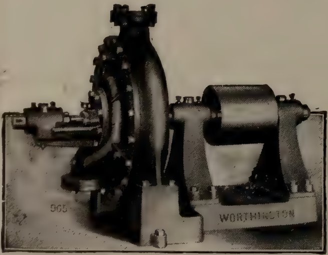

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PAPER FIBRES FROM THE PHILIPPINE ISLANDS.

It appears that the Philippine Islands yield fibre suitable for paper making, which are not yet used for that purpose. According to an estimate issued in 1900, the American paper makers use annually about 100,000 tons of abaca waste (manilla stock) consisting of old bags and strings, in fact as much abaca as jute. Why, then, should not agave fibres be included? Old cords of sisal do not appear in these statistics, perhaps because they are not sold separately. In any case, it is evident that paper makers are fully aware of the usefulness of abaca waste, but are at present limiting themselves to waste made in the manufacturing processes. Why should not the waste incidental to the preliminary preparation of the fibre, which is now merely used as fuel, be also taken advantage of?

Attempts in this direction date from 1887 but nothing much has been done. There is a great want of suitable machinery at the plantations, because the hand work is attended with much waste.

Other plants which might be made use of for paper making are the cogon (Imperata exaltata), the talahib (Saccharum spontaneum), and also bananas and plantains. According to Morris, plantains give a white fibre practically as good as that of abaca in all respects. As regards the banana, the want of strength in its woody fibre, which prevents it from being used for rope or string making would be an advantage from the paper maker's point of view as it is the more easily pulped. Bowstring hemp (Sanseveria ziglanica) is another plant which seems to have before it a great future for paper making purposes. It grows wild all over the islands and is cultivated in places for rope making. Magney is another and important plant allied to sisal. Magney is Agave cantula; sisal, Agave rigida and Agave sisalana. The waste of this plant, used like Sanseveria, for eminently suitable for the preparation of many kinds of paper. At present, like other wastes from ropemaking fibres in the Philippines, it either accumulates to such an extent as to become a nuisance, or is burnt as fuel or used as manure. Fortunately or unfortunately, these wastes usually contain so much of the chemicals used in the preparation of the fibre that they are of very indifferent quality, whether as fuel or as manure. Hence by far the greater part accumulates in heaps, cumbering the soil and creating a nuisance.

Most of these wastes can be pulped by the ordinary methods and yield excellent half-stuff. There can be no shadow of doubt that an important field is open here for the paper making trade, especially for makers of any kind of paper which need not be white. Brown wrapping and coarse papers having to be dyed dark colors could undoubtedly be made very cheaply from these Philippine fibres. It is by no means improbable that eventually they may find their chief employment in the preparation of coarse and colored papers, and that the cordage industry may have to seek fresh fields and pastures new.

◆

Difficulties with Free Rosin.—The use of size containing much free rosin is constantly producing new effects, hitherto unexplained. It is esssential that it should be very perfectly emulsified, to save alum as well as size. This saving also contribute to the preservation of the pulp, as well as of the sieves. Good emulsification is also much more important with wood pulp than with rag pulp, as the former is apt to contain coarse fibres from old wood. Moreover, the drying requires careful regulation when the size used is rich in uncombined rosin. The temperature of the drying cylinder must be such that no very high speed is required.—"Papier Zeitung."

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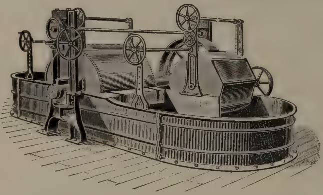

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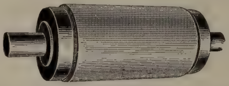

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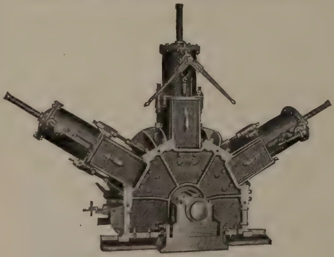

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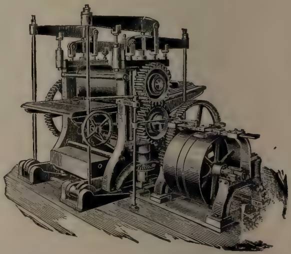

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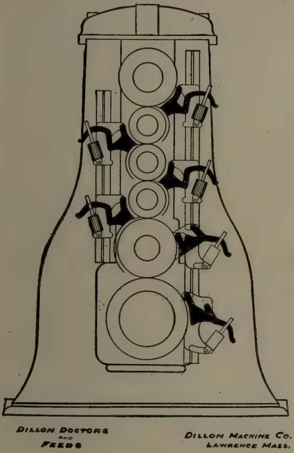

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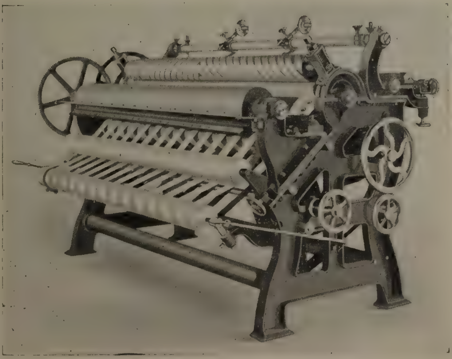

LAWRENCE, MASS., U.S.A

THE MARKETS.

July 12, 1907.

Pulp.—The demand for pulp continues very brisk, and there is barely enough to go around. Across the border there is a scarcity, a condition not improved by the fact that low water conditions in some sections seem to have set in earlier than usual. Ground wood fetches $17 to 18 at the mill, while sulphite remains at the high prices of last month, in some cases realizing $2.30 at the mills. A recent dispatch from Halifax, N.S., stated that wood pulp had jumped from $18 to $23 per ton on that market.

Paper.—In spite of the expectations of some that the hot weather might lead to an easing off in paper most classes have become firmer than ever, and advances are talked of on all sides, though nothing definite in that direction has been decided on by any number of the mills. Both news and wrapping are particularly active. The extremely strong situation in pulp naturally reacts on the paper market.

British.—The feature of the market for mechanical wood pulps, says "World's Paper Trade Review," is its great firmness, supplies being exceedingly limited. It is quite certain now, it says, tha tthe same strong market will prevail all over next year. Moist unwrapped fetches £2 12s. 6d to £2 15s., and dry £5 to £5 10s. Bleached sulphite is £11 16s. to £12 10s. Chemicals are rather quiet but values are well maintained. Ammonia alkali, 58 per cent., stands at £4 10s. to £4 15s.; bleaching powder (soft wood) £4 12s. 6d.; caustic soda, 76 to 77 per cent., £10 10s.; soda crystals, £3 2s. 6d.; salt cake, £2 f.o.r.; and recovered sulphur, £5. Sulphate of copper is quoted £32 7s. 6d.

Pulp is scarce in Norway owing to the continuance of the strikes and the active demand. There are also strikes in Finland and more expected.

❦

—The Northern Engineer Works, Detroit, Mich., have installed in the new plant of the Great Northern Paper Company, East Millinocket, Maine, a complete plant of overhead trolleys and hoists of 3, 6, and 8 tons capacity; also a number of type No. 20 Air Hoists of 1 to 3 tons capacity.

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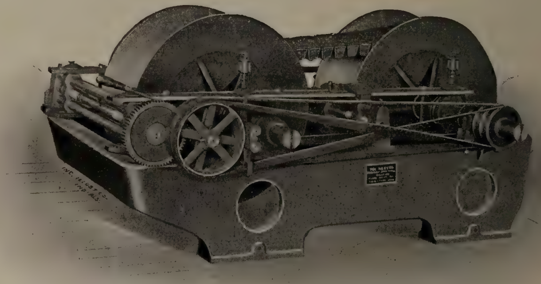

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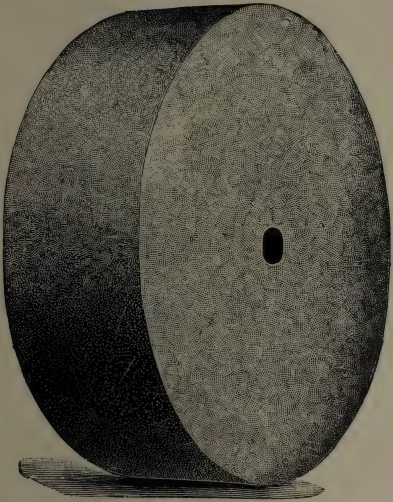

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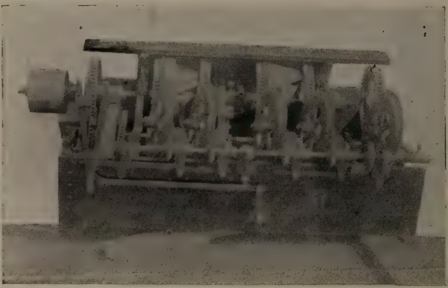

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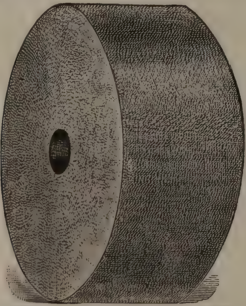

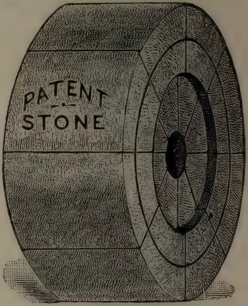

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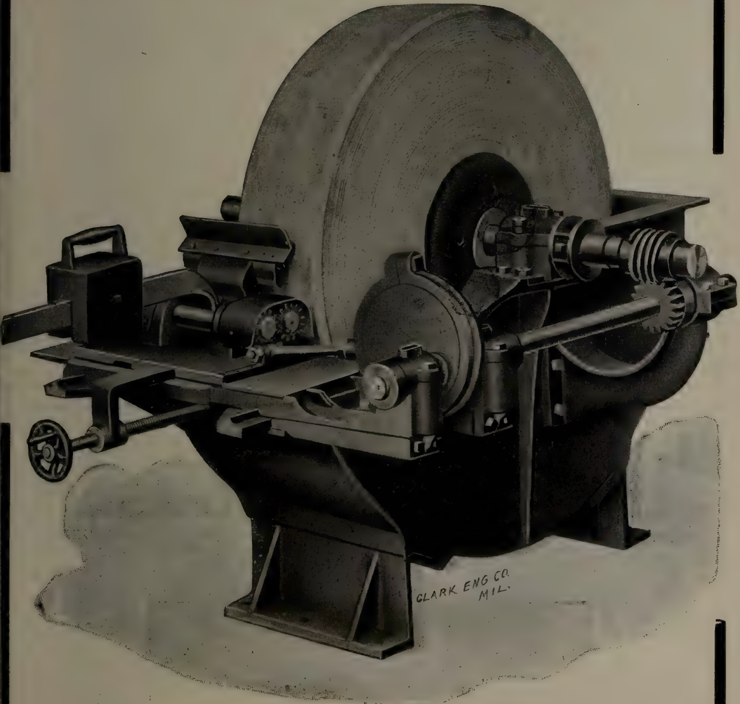

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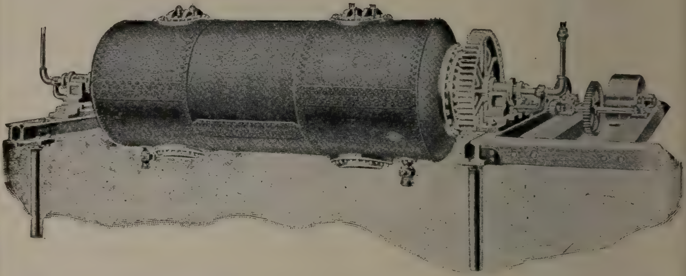

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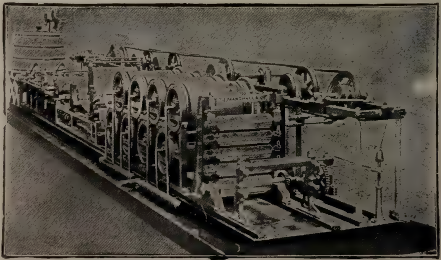

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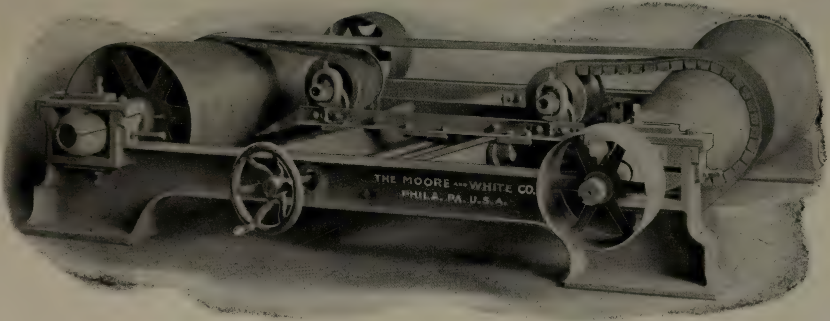

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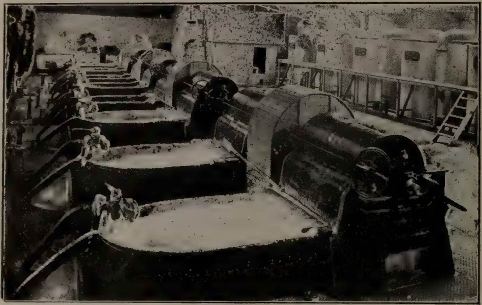

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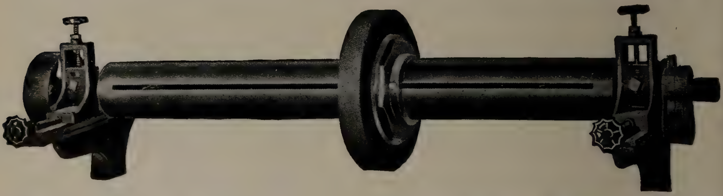

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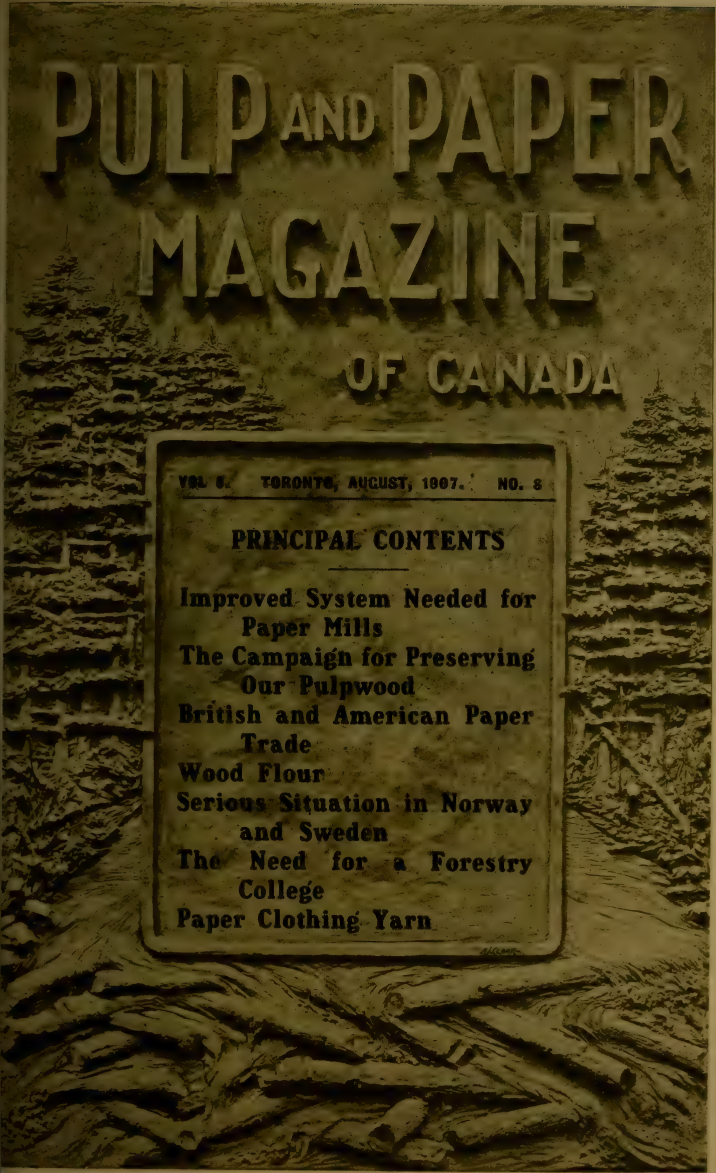

PULP AND PAPER MAGAZINE OF CANADA

VOL 5. TORONTO, AUGUST, 1907. NO. 8

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The Campaign for Preserving Our Pulpwood
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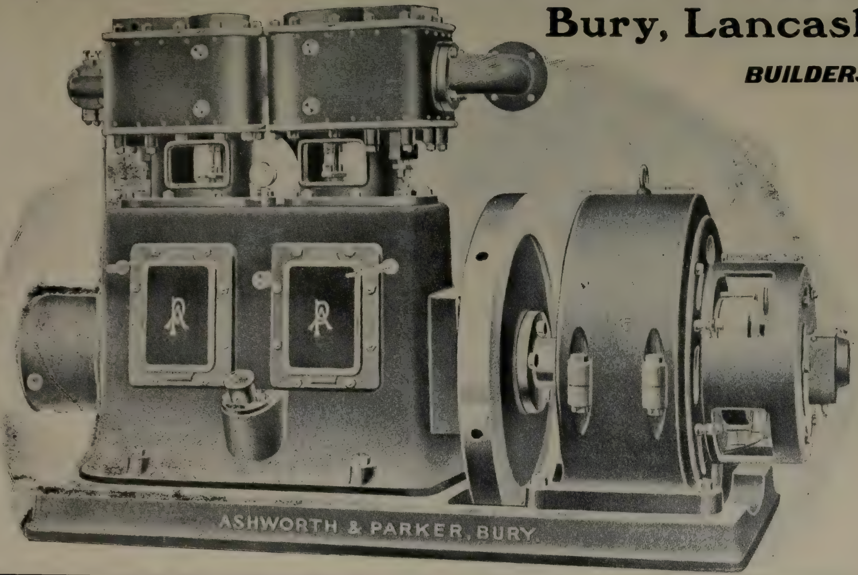

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PULP OPERATIONS IN NEWFOUNDLAND.

The United States Consul in Newfoundland, in a recent report to Washington, refers to the negotiations that are in progress for the establishment of two more large pulp mills in the colony, and says: As all these contemplate the use of American machinery, it is apparent that the equipment of one or more establishments each of which represents a capitalization of $5,000,000, will do much to swell the total of the American exports to the island. E. D. Arnaud, Canadian Trade Agent in Newfoundland, referring to this report says that "Canadian manufacturers of this class of machinery would do well to inquire into the possiblity of making an effective competition for this trade. One of the mills referred to is already in process of construction, and has probably completed arrangements for the required machinery, but the other, I understand, has not yet made any preparations for the erection of its plant."

One of these mills above referred to is, of course, the one proposed to be built by Albert E. Reed & Co., the well-known English paper manufacturers. That firm has taken over the Exploits River property, with the Bishops Falls as the centre of operation, at which point they have purchased about 10 sq. miles of limits. They expect there to develop about 15,000 horse-power from the Exploits River, and to build pulp and paper mills. They have also acquired about 1,200 sq. miles of timber property, which is expected to give ample supply of wood for all requirements. Development work has been placed in the hands of G. F. Hardy, of New York, who is now busily engaged with surveys, and when these are completed definite plans will be decided on for the future. The Bishop Falls, where the dam will be on, is within a mile of the Bishop Falls station of the Newfoundland railway.

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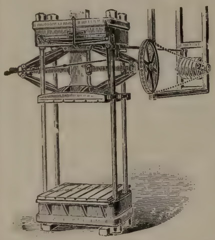

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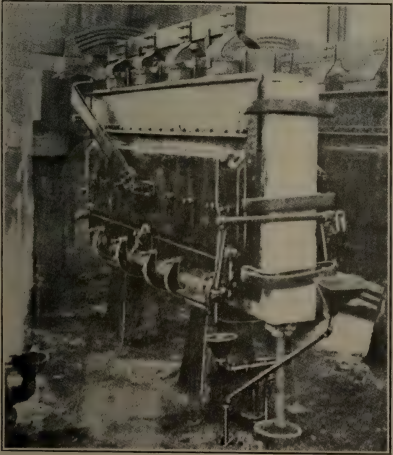

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THE
PULP AND PAPER MAGAZINE
OF CANADA

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IMPROVED SYSTEM NEEDED FOR CANADIAN PAPER MILLS.

An English contemporary asks: What is the matter with the American paper mills? And we, alluding, however, to another subject, would ask the same question of some of those in this country. By this we do not mean that they do not turn out good goods, nor that they are not enjoying prosperity, nor that they are not making good progress. It may be suggested, however, that, with a little careful thinking on the part of at least a few of them these happy conditions might be accentuated. So far as we can learn, we would imagine that the trouble lies in a lack of system, which prevents the greatest possible amount of work being obtainable either from machines or men. In some mills certain machines do not turn out the percentage of product or profit which they are supposed to turn out, or which they do turn out in other mills. We have seen cases where paper has been brought in from England, paying freight and all charges, at a lower price than a similar grade of paper can be produced for here. And similar examples can be found in paper made in United States mills, where the labor has been higher. Of course, in the latter case, duty has to be added, which gives the preference to the Canadian article. But the better class of Canadian manufacturers do not want to protect themselves behind what in a manner is a somewhat adventitious barrier. They want to turn out the best paper that can be turned out, and at the cheapest price. There are quite a few instances where the product of English and American mills has a better appearance than the equivalent paper turned out in Canada, though probably in its turn the Canadian article can boast of superior tensile strength. This is an advantage, though for many purposes a better appearing paper with slightly less strength will really fill the bill a little better. All these are points which it will be well worth while for Canadian paper manufacturers to consider carefully.

But the main point which we are trying to make is that some of our Canadian paper mills seem to be going along in a pleasant jog-trot sort of a way which, though it is well enough while all the conditions are prosperous, is not adapted to the constant improvement of their status, which should be ever in their mind; nor does it get out of the business all it is capable of. What is needed is a little more hustle, a little better systematization.

* * *

THE CAMPAIGN FOR PRESERVING CANADA'S PULP-WOOD.

The movement long advocated by the "Pulp and Paper Magazine," and now accelerated by the campaign of the Toronto "Globe," to restrict the exportation of Canadian pulp-wood, so that this great resource will not be mainly expended in the aggrandizement of commercial competitors, has made great headway. Almost all the important newspapers in the Dominion have placed their influence in the scale to obtain what is, after all, not so much a commercial advantage as a necessity for our future national well-being. The point is simply this: One of the greatest necessaries of civilization has been ruthlessly squandered in the past, both in Canada and the United States. Canada has relatively much more of it still left to her than the United States, chiefly because the squandering began later. Now both countries see that something has to be done, and done at once. There is no question of hitting a rival, or of retaliation, in this matter; it is simply one of making the most advantage of what is left to us. If the balance of pulp-wood wealth remains in favor of this country, so much the better; to conserve it, now we know its true value, is but barest wisdom for an enlightened country.

And that is just what is happening. The people of Canada **are** learning the true value of the pulp-wood, which is still so abundant in many of our forest sections. And, gradually but surely, people of all Provinces and of all shades of politics, are making up their minds that its unrestricted exportation must be put a stop to.

Almost every mail brings us some fresh evidence of this growing opinion. A correspondent in Nova Scotia, interested in the manufacture of ground wood and paper, writes us as follows:—

"At one time I was against an export duty on wood, believing it was not fair to those communities far removed from pulp mills, and where there was no power available for driving mills. The export trade seemed to be the only use they could put these woods to, but lately I have changed my mind, for the larger interests of the pulp and paper industry overshadow the benefit of shipping woods, and something should be done to prohibit the shipping of wood."

The prevailing opinion is that the Dominion Government should place an export duty on pulp-wood going out of the country to be manufactured into pulp, which is taking place on an ever-increasing scale in the Provinces of Quebec and New Brunswick. But some very good judges go a step further. For instance, W. H. Rowley, president of the E. B. Eddy Co., Hull, according to the report of an interview with him appearing in the "Globe," comes out very flatfootedly in favor of the absolute prohibition of its export altogether. J. R. Booth holds the same opinion.

Hear what a purely disinterested onlooker has to say about it. R. W. Perks, a member of the Imperial Parliament, and a very pronounced free trader as far as his own country is concerned, said the other day when on a visit to this country: "But were I a Canadian, I would be a protectionist. It is essential to foster local industries. I would use all my influence, were I a member of the Canadian Parliament, to prevent the export of raw materials, such as pulpwood, taken to the United States to be made into paper, and then reimported into Canada."

There are many indications that the anxiety of the American paper manufacturers about pulp-wood is fast changing to alarm. This month we heard of a man who operates a paper mill near Harper's Ferry, Virginia, having to close down, owing to not being able to get any more wood, and visiting Canada in the hope of supplying his needs. As we understand it, he did not succeed in doing so. And now again there comes a report, in connection with the large new paper mill merger in the Western States, that one of its main objects is to ensure a large reserve of raw material, for which they are sending to Canada! So it will be seen there is no mistake in the idea of the growing shortage in supplies. Shall Canada give away her own stock, and then be bankrupt in her own business?

The way some American authorities are disposed to look at the whole matter is indicated in the following extract from the New York "Commercial":—

"Canada may almost any day impose such a duty on them (pulp logs) if only for self-protection—the Province of Ontario has already done so (sic.) An immediate result of it, no doubt, would be the investment of much good American money not only in Canadian spruce lands, but in paper mills there; the United States would lose all the benefit of this capital, and the consumers of paper here would have to pay duties on the imported article. If we defer the closing of a fair trade-reciprocity treaty with the Dominion much longer, the Kanucks may easily and speedily be put into a mood that would lead them to take a sharp advantage of our spruce and paper necessities."

BRITISH AND AMERICAN PAPER TRADE.

There is one side of the paper trade which presents very contradictory aspects in Great Britain and the United States, respectively, at the present time; that is to say, the export branch, which in the Old Country has shown a remarkable advance during the past half-year, and simultaneously in the United States a marked decline.

During the six months ending with June 30th last Great Britain exported paper to the value of £1,157,038 (including £12,285 worth to Canada), an increase of £169,705 compared with that same period in 1906. This was accompanied this year by a decrease in the importations of paper into Great Britain of £147,944, the total imports amounting to £2,691,595.

In the United States the trade would seem to have set in the contrary direction, for in the year ending May 31st last the imports of paper into that country exceeded the exports by about $600,000, while two years ago United

States exports of paper exceeded imports by 50 per cent. Old Country paper men who think this new ratio probably a permanent thing will have to bear in mind that the United States and England regard the export branch of their trade from different view-points. In the United States, as a rule, the only time when special attention is paid to exporting is when there is a surplus of the article in the home market. This is so far from being the case at present with respect to paper that the trouble is not to dispose of the product, but to get enough to go around. We trust that the present satisfactory condition in the British trade will continue, but we fancy that if it depends on present conditions in the United States it will last only so long as the present exceptional activity in the home market prevails in the latter country.

PULP AND PAPER NEWS.

The Winnipeg Scandinavian Publishing Co., Ltd., has been incorporated.

* * *

The Gazette Printing Co., Ltd., Montreal, has been incorporated with a capital of $5,000,000.

* * *

Bain & Cubitt, Limited, Toronto, wholesale and retail stationers, bookbinders, etc., have been granted a charter.

* * *

L. A. Delaplante, Limited, has been granted a charter to take over the business now carried on under that name in East Toronto, Ont., to manufacture and deal in lumber, pulp, etc.

* * *

J. R. Booth has received an extraordinary number of orders for news paper from the United States lately. He has also been shipping somewhat extensively to Japan at profitable prices.

* * *

The exports of wood pulp from the port of St. John, N.B., to the United States this season are larger than ever before. The figures are, wood pulp, $186,757; pulp-wood, $1,857; lumber, $42,449.

* * *

Letters, Limited, Toronto, have been incorporated with a capital of $40,000 to carry on a printing and publishing business. The provisional directors include A. C. Bedford Jones, and F. H. Lytle, Toronto.

* * *

The E B. Eddy Co., Hull, Que., in spite of having installed their large new paper machine, are still almost overwhelmed with business. They recently withdrew all quotations on orders for export.

* * *

The Martin Corrugated Paper & Box Co., Ltd., Toronto, has been granted a charter. It will take over the business now carried on under that name, and deal in boxes of all kinds, paper, pulp, pulpwood, etc.

* * *

The W. C. Edwards Company, of which Senator Edwards is the head, suffered a quarter of a million loss by a fire last month at New Edinburgh, a suburb of Ottawa. Their sash and door factory, planing mill, and much valuable lumber were destroyed.

* * *

The Spruce Lumber Co., Ltd., Ottawa, has been incorporated with a capital of $45,000, to carry on the business of lumbering, manufacturing pulp and pulpwood. Chas. McDonell, Ottawa; and Duncan B. McDonell, of Winnipeg, are charter members.

The Argenteuil Lumber Co., Ltd., Morin Flats, P.Q., has been granted a charter to do business as lumbermen, and manufacturers of pulpwood, pulp and paper. G. H. Perley, Montreal, and J. P. Middleton, Morin Flats, P.Q., are members of the concern.

* * *

M. B. Perine & Co., who have taken over the business of the Doon Twine and Cordage Co. at Doon, Ont., are making plans whereby some $50,000 will be spent in improvements. Most of the old holders remain in the company under the present re-organization.

* * *

The United States & British Columbia Timber Co., Limited, Calgary, Alta., have been incorporated with a capital of $2,500,000, to manufacture pulp wood, timber and lumber. The provisional directors include R. B. Bennett, W. P. Taylor, W. H. McLaws, Calgary, Alta.

* * *

Brown Bros., Co., Toronto, the well-known stationers and book-binders, celebrated their jubilee a few days ago. The only survivor of the three brothers who composed the original firm is Richard Brown, than whom there is no business man in Toronto more respected and generally liked.

* * *

The hydraulic plant now in process of construction at the International Falls, on Rainy River, near Fort Frances, under superintendence of J. T. Fanning, American Civil Engineer, is now well advanced on the Canadian side, and work has been started on the American side. The work of power development, however, is a heavy task, and we understand that contracts for machinery for the pulp mill will not be called immediately.

* * *

The deal by which the Quebec, Montreal & Southern Railway becomes the property of the Delaware & Hudson Company has just been consummated. The road extends at present from St. Lambert to Pierreville, and the work of grading for its completion to Quebec will be started immediately. The purchase is chiefly for the purpose of opening up the pulpwood districts of the south shore and carrying shipments for numerous mills in Delaware & Hudson territory.

* * *

Owing to low water on several tributaries of the Ottawa River an immense quantity of pulp-wood has been stranded and probably will not be removed this year. The drives on the Petawawa and Gatineau Rivers, says a dispatch from Ottawa, are in a very bad state. Unless early autumn rains occur the situation will be very grave. The present conditions are due to the early floods, which passed away while the ice still held the timber frozen in the stream.

* * *

William Hamilton, Limited, Peterborough, Ont.; capital, $300,000, is the name of the concern recently organized to take over as a going concern the property of the William Hamilton Mfg. Co., in Peterborough, and to manufacture and deal in machinery, etc., and act as engineers, machinists, willwrights, etc.; W. G. F. and Adam Hall, and A. E. Coulthard, of Peterborough are among the provisional directors.

* * *

The British American Wax Paper Co., Ltd., of Toronto, Canada, capital, $50,000, is starting a factory in Toronto at 73 Adelaide St., West, to do a waxing and specialty printing business; for instance, printed roll work, gummed labels, rolls suitable for automatic wrapping machines, confectioners' waxed wrappers, printed and plain. Its chief line will be the manufacture of confectioners' wrappers. The company will not manufacture paper, but will buy that material and carry on the process of waxing it. They will own outright the Canadian patents on candy-kiss wrapping machines, and will also have the agency for machines to wrap chewing gum, caramels, chocolate cakes and soaps. V. H. Wilshire will be president and manager in Toronto, and the factory will be in full operation by September 1st. The organizer of the company is S. M. Ramsey, of Cincinnati, Ohio.

(Continued on Page 190.)

NEWS OF THE MILLS.

C. J. Bastedo, formerly purchasing agent of the Canada Paper Co., is now with John R. Booth, Ottawa, and Mr. Strumbert succeeds to that position in the Canada Paper Co.

* * *

The pulp mills of the North River Lumber Company at St. Anne's, C.B., were totally destroyed by fire on 20th ult. with heavy loss. The warehouse, stable and wharf were saved.

* * * *

Frank Lauber, the 14-year-old son of Isaac Lauber, was badly injured in the Toronto Paper Company's mill at Cornwall, Ont., on the 8th inst. The lad was caught in a belt and whirled around a swiftly-running shaft. Both legs were broken, and he received a severe cut across the back of the head, besides sustaining several other injuries.

* * * *

Edward Trout, who has so long been identified with the Toronto Paper Co., has resigned as secretary of that company, and Alfred W. Briggs has been appointed to that position in his stead. It is interesting to note of this old-established and solid company that its first board meeting was held in July, 1881, and that ever since its first year, when, of course, great expenditures were being incurred, it has been on a paying basis, and never passed its half-yearly dividend. It may be stated that the site for its mill at Cornwall, Ont., was chosen after several visits by Mr. Trout and John R. Barber to different towns with the object of selecting the very best location available. The remarkable success this company has achieved is largely due to the energy and wisdom of Mr. Barber, its well-known president. Mr. Trout for some time past has resided, for a large portion of each year, out of this country, and desiring to continue this even to a larger extent in future, decided to resign the secretaryship, though he will still retain the office of treasurer. The directors, in accepting the resignation, passed a resolution deeply regretting Mr. Trout's partial severance from the company, with which he had been connected since its earliest organization.

* * * *

The Sault Ste. Marie Pulp and Paper Company's ground wood mill, which was partially destroyed by fire on April 24th, has resumed operations after having been thoroughly rebuilt, including many important improvements. The latter include an increase in the screen capacity. The paper mill, in which are manufactured building and tarred paper and manilas, has also been started.

* * *

The Imperial Paper Mills, Sturgeon Falls, closed down on the 22nd ult. on account of labor troubles. The paper-makers were discharged some time ago for refusing to do Sunday work unless paid time and one-half, and the mill then engaged non-union paper-makers. This introduction of non-union labor in the paper mill, however, caused the union pulp workers to walk out and the entire plant then shut down. So far, there has been no disturbance, and it is hoped the matter will be arranged.

* * * *

—Dr. B. E. Fernow, Dean of the new faculty of Forestry in the University of Toronto, gave a lecture a few days ago which was listened to with particular attention by a large number of people, both in and out of the university. After tracing the gradual evolution of plant and tree life upon the earth, the Professor entered upon the "human" side of the subject, and showed how wasteful were man's methods of harvesting the wood crop, and how reckless he was as to conserving this wealth for future generations. His advice to school teachers and others of influence over the young was good, and was to the effect that they should not so much introduce forestry into the schools as a subject for separate study, but rather that they should obtain all possible information for themselves, and then work in this material in connection with the teaching of other subjects.

(Continued on Page 190.)

A FORESTRY COLLEGE FOR ONTARIO.

By Thomas Southworth, Director of the Ontario Bureau of Forestry.

Do we need trained foresters is a question easily answered. We do. That the men or the interests that would be profitably served by them are all prepared to agree with me in this is by no means certain, however, and unless the men controlling the forested lands of Canada can be brought to this point of view, I cannot see that we have any particular need of a College of Forestry. There are several excellent Schools of Forestry in the United States. The training there is such as to fit men to cope with the forest problems much the same as exist on this side of the international boundary, and if but few openings for foresters offer in this country, we have no need to expend the money and the effort to train the few men required to fill them.

It is apparent, therefore, that our need for a College of Forestry depends on the probable demand by employers for the services of its graduates, and a canvass of the situation in this regard will be of interest. In this I shall refer to Ontario, with which I am more familiar than with the rest of Canada.

The forest lands of Ontario for the purposes of this discussion may be divided into three classes: Those under a practically perpetual lease to lumbermen; those under lease to lumbermen for a fixed period; and those still held by the Crown free from lease or "license to cut," as it is usually termed.

The first and second classes comprise about twenty-one thousand square miles, or about thirteen and a half million acres of forest lands. On some of these areas the encroachments of agricultural settlement will some time cause the abandonment of the lease or license, but by far the greater part of this area is not adapted for agriculture, and will or should continue to be timber producing. These lands, as stated, are under license to individuals or companies, and the nature of the lease is such as to leave the control and management of them almost wholly in the hands of the lessees subject to the payment to the State of a ground rent and stumpage dues.

In 1903, with a view to ascertain the chances of employment for forestry graduates, I wrote to a number of the leading lumbermen of the Province. Replies were received from all of them, and there was a striking unanimity of opinion among them to the effect that a college graduate would be of little use to them owing to his want of practical knowledge in the bush, saw mill and lumber yard.

I am glad to be able to say that one of these men has so far changed his opinion as to tell me recently that he proposed to engage a forester to go over a newly-acquired limit and prepare a working plan for operating it on the basis of removing yearly only the amount of timber that would equal the annual growth. This is very encouraging, and a sign of the times, but it is an isolated case, and cannot be taken to mean that the lumbermen are going to engage foresters in large numbers.

When the graduates in forestry are able to demonstrate their ability to increase the profits of the lumbermen, they may look for profitable employment among them, but not before; and this demonstration must be made in Ontario, or at least in Canada. If they can show that they are no mere theorists, but practical, well-trained men, capable of directing large lumber operations economically, they may be assured of employment by the private holders of timber lands, who are business men, and willing to pay for efficient service.

I doubt very much if there is any business in this country carried on with so little regard to economy, with so much waste, as the great lumber industry. This state of affairs has been due to no lack of desire on the part of the limit holders to make as much money as possible from their timber holdings, but their operations were conducted on a large scale, often at great distances from the head office, and the proprietors had to depend on the work of men whose whole training had been received under similar wasteful conditions. In most cases these men are not observant except in one beaten path. They learned, in the gradual promotion from a lumber jack or shanty man to foreman, and perhaps to superintendent, to estimate the quantity of timber a given tree would make, and to make a good guess at the quantity of standing merchantable pine on a given area, but their methods of removing this timber are in most cases those followed by their predecessors with little change. The damage done to young timber in felling trees which could be largely avoided they seldom take into consideration. In fact, the trees too small to make merchantable timber are usually regarded as of no value. A prominent lumberman told me a few years ago that he had incurred the pitying contempt of his foreman by giving orders that they should not use young pine trees for roads and shanties when balsam, poplar or other less valuable trees could be got for the purpose. Men with their training are apt to have very little idea of the rotation of the forest crops, of the reproduction of trees or many other things useful to know in forest operations involving a long term of years.

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* From an address delivered before the Canadian Institute, Toronto.

That lumbermen will ultimately recognize the rule of this knowledge I have no doubt, but they will need to be convinced by the actual work of trained foresters. I do not pretend to say that the methods of lumbering so far followed by Ontario limit owners has not been on the lines of good forestry from the point of view of their financial interests. Practical forestry is simply business, and in the case of these timber licenses issued from year to year, liable to be cancelled if the land was needed for settlement, it was quite natural and wise that the lumbermen should remove all the timber, mostly paid for in a lump sum in advance, as cheaply as possible and as thoroughly as they could. It was liable to burn up, the license might be cancelled, interest charges on the money paid in advance for the timber accumulated, and the lumberman followed proper forestry methods in cutting his timber off without much thought of the future.

What was good forestry for the lumberman, however, was not wise forestry practice for the State, and let us hope that some time even on this class of timber land forestry methods more in the joint interest of the State and its lessee, the lumberman, may prevail. With security of tenure, the lumberman would be equally interested with the State in conservative lumbering, and could afford to accept cutting regulations to that end. If, however, the lumbermen will not employ foresters, how are they to be convinced, may well be asked.

By far the greater part of our forest lands are held by the State free from license to the lumbermen, and I submit that the first large employer of properly trained foresters and forestry students should be the State. Under the Forest Reserves Act of 1898, over ten million acres of forested lands, unsuited for agriculture, have been set aside as permanent forest reserves. These reserves will doubtless be added to from time to time as the unfitness for agriculture of other areas is proven. I have elsewhere expressed the opinion that not less than forty millions of acres of similar non-agricultural land in Ontario should be placed in reserves.

In one of these, the Temagami Reserve, important discoveries of minerals have recently been made; there will be a large number of mining prospectors travelling it this season, and it is probable that some definite policy governing mining development and protecting the State's interest in the timber will be adopted in the near future. The Legislature has just voted $5,000 for "estimating" the Temagami Reserve. This I take to be for the purpose of beginning the systematic examination of the reserve, and I presume will include not merely an estimate of the merchantable pine, but a general topographical survey and an estimate of the various kinds and quantities of timber in order that working plans for the systematic handling of this forest for a long term of years may be prepared. To do this work trained foresters will be needed, and they do not seem to be at present available.

Mr. Southworth went on to show that, aside from the forest reserves, the Government employs a large number of men as Crown timber agents, bush rangers and cullers or scalers. Some of these men might well be trained foresters. In 1898 there were not half a dozen technically trained foresters employed in the United States; now there are about nine hundred. Two hundred are graduates in forestry, and more would be employed if they could be got. That the lumbermen will employ these men as soon as they show ability was shown by the fact that Dr. Judson Clark, of the Ontario service, and Mr. Roland Craig, of the Dominion service, had been given more lucrative positions by British Columbia lumbermen. The need for trained foresters he considered already apparent, and it would become increasingly more so; and he had no doubt that the graduates from the school under Dr. Fernow would prove themselves the equal of any on the continent and competent to work out the problems presented in Canada.

FREE ACIDS IN PAPER.

The presence of free mineral acids in paper can only be due either to gross errors in manufacture or to the later information of the acids in the finished paper, says an expert.

Out of 200 samples of all classes of paper which he tested, none were found to contain free acids, while about one-fifth of them showed an acid reaction in consequence of the presence of alum or of sulphate and aluminum. He likewise states that the sulphuric acid used in bleaching could not be present, adding that the free muriatic acid produced in the liberation of the chlorine by means of sulphuric acid is neutralized by the alkali of the rosin size, any traces being removed by the heated drying cylinders. Should, however (through intentional saturation with acids, or through the formation of chlorides), sulphuric or other free acids be present in the paper, their effects are shown by its turning yellow and by being more easily torn, as well as through the size losing in strength.

Qualitative indications are obtained by means of litmus for acid reaction and Congo for free acids. Quantitative indications are best obtained by means of n/10 potash lye, in conjunction with Congo. Congo red cannot be successfully used when there is a large quantity of sulphate of aluminum present, as a brownish violet tint is produced which renders it difficult to define the reaction. This objection is, however, theoretical, as the 16 to 32 square inches of paper tested never contain enough alum or sulphate of alum to disturb the reaction.

The results are thus summarized:—

First. The quantitative definition of free mineral acids in paper is most simply and securely effected by titration with n/10 lye and using Congo red as an indicator. Second. The presence of free acids in paper can only in the rarest instances be attributable to the manufacture. It is probable they are only formed during storing. Third. Free acid is very seldom found in paper, but when such is the case, the paper obstinately retains a smaller or larger portion, which influences in the most unfavorable manner the appearance and the quality of the paper.

THE MOISTURE QUESTION IN FRANCE.

French importers of wood pulp have long had their difficulties with the Customs House officials in regard to the moisture content of wood pulp, and the question is one which frequently comes up elsewhere. Now, F. Persoz, Director of the Paper Testing Laboratory of the Parisian Chamber of Commerce, has been appealed to for an expert opinion, which he gives in "La Papeterie."

It is obvious, he says, that a material which may contain 50 per cent. of water at the time it is shipped is pretty certain to lose some of its moisture en route to its destination, according to the season and the delays—frequently long—which may take place before it reaches a French port. If the weight of the bales at that port is less than that which is given on the bills of lading, it is evident that some moisture has been lost by evaporation, so that the good faith of the importer cannot in such case be impeached, when he declares to the Customs that the pulp is "moist," and thus entitled to entry at the rate of 50 centimes per 100 kilos., in place of the franc that is chargeable on "dry" pulp.

His laboratory has had several cases of the kind to deal with. It was recently called upon, for instance, to sample a consignment of 4,880 bales, some days after its arrival in France. There were two parcels, sold as containing 55 per cent. of water. The bales selected for sampling were weighed with great care, the average weight in one lot being 108.9 kilos, and in the other 110.45 kilos., instead of 127 kilos. apiece, which was the weight declared by the importer. The bales having thus lost so much of their original weight, the percentage of moisture was, of course, considerably lowered. In the end it was found to be only 48.9 per cent. in the case of the first lot, and 49.8 per cent., in that of the other. If the Custom House officers had acted on the letter of their instructions, they could have stopped these two parcels of pulp and subjected them to the hig' r rate of duty, as "dry" pulp, a decision which would have been doubly unfortunate for the seller, as he would have been liable to pay duty on the declared weights, which were, as we have just seen, much higher than the actual ones, owing to the loss of moisture by evaporation. As it was, he was a loser to the extent of about two kilos. per bale, owing to the variation in the percentage of moisture.

It often happens that, in a lot of which the average humidity is superior to that classed by the Customs as "moist," one comes across a certain number of bales containing much less than the regulation 50 per cent., as low as 42 per cent., for instance, a circumstance that has occurred in M. Persoz's experience. In fact, it is practically impossible that such a material as wood pulp, delivered without protective wrapping, and thus constantly exposed to the air, should retain 50 per cent. moisture for any length of time.

Having regard to this, and the other considerations touched upon, M. Persoz thinks it would be well for the French Customs Department to instruct its officers to take their samples of pulp from the centres of the bales; that is to say, from those parts which are least affected by evaporation. As far as possible, also, the samples should be taken from those bales which most nearly approach the declared weight. It seems only reasonable, too, that in cases where the percentage of moisture is only a trifle below 50 per cent., that some allowance should be made for the evaporation of moisture which has occurred between the port of shipment and that of arrival, so as to account for the difference between the declared and the actual weights. M. Persoz's idea of how such calculations should be made is as follows:—

Let P represent the declared weight of the moist pulp, H the percentage of moisture at the place of origin, P′ the actual weight as ascertained by the Customs officials, and H′ the percentage of moisture found by them on the basis of their own weights. It is evident that the moisture contained in P, before evaporation, is represented by P—P′, or with the moisture found in P′, a total of P—P′ + P′ H′. The percentage of moisture H originally contained in the pulp will be expressed by

$$\frac{P}{P—P' + P'\ H'} = \frac{100}{H'}.$$

$$\text{in which } H = \frac{100}{P}\ (P—P' + P'\ H').$$

In order to show how this formula works in practice, let it be applied to an example. Suppose that in a parcel of 2,000 bales, of the declared weight, as supplied by the exporter, of 127 kilos. each, the Customs people find that, on arrival at a French port, the bales only weigh an average of 100 kilos. each, with a percentage of moisture of 46.5 per cent. In this case the value of H is 53.6; that is to say, that the pulp passes from the category of "dry" pulp into that of "moist."

In conclusion, M. Persoz considers that it is an anomalous position for the Customs authorities to take up, to calculate the percentage of moisture from bales which have lost water by evaporation, and then to calculate the duty on the full declared weight, when this is much greater than the actual one.

THE DEVELOPMENT AND FUNDING COMPANY.

This company which has a large plant at Niagara Falls, N.Y., has now commenced operations in Canada with a plant at Nigara Falls, Ont. They make the Townsend cell which can show a record at Niagara Falls, N.Y., of continuous operation during a year and a half. Many believe that the failure of diaphragm cells is due to rapid deterioration at the diaphragm, and some inventors have gone so far as to dispense with diaphragms entirely. C. P. Townsend, collaboration with Elmer A. Sperry, contributed many of its main engineering features, have, in the Townsend cell, solved the problem of the diaphragm cell in a new way.

The main object in electrolytic cells should be to counteract the tendency towards recombination of the alkali hydrate liberated at the cathode with the chloride set free at the anode. This recombination is rendered possible by diffusion, and whatever restricts diffusion will also retard recombination, which not only involves loss of efficiency, but leads to the formation of certain oxygen compounds. These compounds are injurious insomuch as, being split up by the electric current, they disaggregate the graphite anodes, and thus lead to rapid corrosion. Dr. Baakeland, in addressing the New York section of the Society of Chemical Industry recently, showed that it was not enough for a cell to show favorable efficiencies; there was its commercial quality to be considered. If the cell were too delicate to be operated with ordinary skill, or if its cost for maintenance and repairs, or its initial cost were too high, its commercial value had to be very materially reduced.

In the Townsend cell, diffusion and recombination of cathodes and anions are counteracted by automatically subtracting every drop of cathode liquor as soon as it appears, and surrounding it with a " chemically inactive and physically immiscible liquid, which in this case is kerosene.

At the Niagara Falls, N.Y. works, the Townsend cells, which have been in continuous operation since early last year, producing daily an average of 5 tons of caustic soda, eleven tons of high grade bleach, are in sets of 64 cells, each carrying 2,000 to 2,300 amps., and new ones are being constructed to carry 4,000 amps. They are 8 feet long, 3 feet high, and 12 inches wide, are operated under an extraordinary heavy current density, or about 1 amp. per square inch of anode surface. The initial cost, especially compared with that of mercury cells, is extremely small, and the renovating of diaphragms under this system very simple and inexpensive.

PAPER CLOTHING YARN.

C. Bailey Hurst, United States Consul at Plauen, Saxony, sends a report upon the new paper cloth, which has created so much interest in Germany:—

While the term "paper yarn" expresses the new material in a popular way, the designation "wood yarn" may be held as preferable. The yarn proper is cellulose fibre converted into flat strips of the thickness and width required for the making of a particular number. These narrow strips are then spun automatically on especially constructed machines, sometimes alone, and, again, when extra strength is required, around a minute cotton thread, which comprises from 2 to 5 per cent. in the strongest yarn, of the material used in xylolin, the variety of paper yarn made in Saxony. Although the paper string for tying small parcels is familiar to the public, it is known to the trade that this is a twisted product, and has never been produced in uniform thickness, which, even aside from the sizing with which it is often treated and its other unadaptable qualities, prevents its general use for textiles.

It is not sought to obtain elasticity in the paper yarn. Strength and flexibility are the objects in view. Yarn, by the new process, can be produced from wood fibre far cheaper than from shoddy or from the waste of cotton mills, which materials, limited in quantity and irregular in supply, unadapted to the finer shades in dyeing, and more expensive, are inferior to cellulose for the purposes to which xylolin is put. A fabric of good paper yarn can be laundered again and again. An instance may be cited of a piece of white drugget made of paper yarn, intentionally placed before a door of a busy office, tramped upon incessantly for two years, that has been washed some fifty times, and comes out white and strong, so that the period of its usefulness is by no means at an end.

Efforts have been made heretofore to weave common paper twine, but every endeavor has been futile, as it is unsuited for the purpose. Several patents have been taken out in the United States to turn paper into yarn, and one mill there makes its paper yarn under an American improvement, the patent rights to which have long since expired. Paper yarns have been experimented with for over a generation. The German products, from the specimens that have come under my observation, possess perfect uniformity as to thickness, and they have no relation whatever to parcel twine.

The question of cost rightly takes first rank in the consideration of the new yarn. So far as ascertainable from the Saxon mills, the labor in producing one kilo (2.2 pounds) of wood yarn is three pfennigs ($0.00714) per kilo, or three hellers ($0.00609) in Bohemia. The paper yarn itself is sold wholesale at 80 pfennigs (0.1904) a kilo, whereas the cheapest cotton yarn available for the textile industries in this neighborhood costs at present 2.4 marks ($0.5712) a kilo—three times the local price of the new yarn. A spinning machine for producing medium numbers of xylolin has from 72 to 100 spindles; 2,000 spindles can produce 6,000 kilos (six long tons) of the wood yarn in one day. For about 4,000 marks ($952) a machine up to 120 spindles can be built for the spinning of xylolin.

As this yarn can be woven into almost any fabric, such as dress materials, tents, bathing suits, imitation Panama hats, carpets, and grain bags, one manufacturing plant cannot well produce all the articles for which paper yarn may be employed. While the industry has well passed the experimental stage, it is nevertheless of such recent development that the paper or wood cloths are not generally found in the retail stores, or at least advertised as such. There are now two mills in Germany producing together 10,000 kilos (twenty long tons) of xylolin daily. One large manufacturer, it is stated on credible authority, after obtaining unequivocal results from the new yarn, placed an order for 300,000 kilos (600 long tons) for his carpet mills.

One of the most important jute spinning and weaving firms in Europe has contracted for the privilege of making combination bagging of paper yarn and jute, an article that has proved to be a great success, not only on account of the cheapness compared with bagging of jute, but, incidentally, having the quality of being odorless; bagging of paper yarn alone can be more advantageously used for sugar, coffee, salt and other products susceptible to pungent odors. Tapestries, not printed, but woven in colors, as well as toweling of xylolin, are alike turned out in great quantities. Not only can the yarn be used in coarser fabrics, but it has also been tried successfully in hand-made cushion laces. There is a desire to take it up in a measure in this machine-made lace centre. The yarn can be readily used in knitting and plaiting. Woven xylolin treated with a waterproof dressing does not seem to crack by wrinkling or friction to the injury of the water-resisting coat. One would imagine that a fabric of paper yarn would readily ignite, and that a lighted match falling on a paper rug could be exceptionally dangerous. The fact is, however, that a burning match stem will do more damage to a woolen or jute rug, and be more likely to lead to disastrous consequences. While not uninflammable, an ordinary rug of paper yarn will burn scarcely easier than a wooden floor. Some criticism, apt to be misguiding, has been offered about paper cloth, with an inclination to compare it to sheet paper or rubber, whereas even underclothing made of paper yarn has been found by experience to be satisfactory. Modern authorities on hygienic clothing decry the wearing of garments that are so woven as to permit only a very slow exchange of the toxic emanations of the body with the outer air. Accordingly, there is everything to hope for in a wide use of woven or knit paper cloth garments, not only among people who cannot afford to buy more expensive clothing, but also among well-to-do classes, because the paper material is cleanly and readily laundered; even caustic soap, instead of injuring it, makes the fabric softer.

As stated in a previous report, the purposes to which paper yarn can be put are really so diversified that it is difficult to circumscribe its field of usefulness. It cannot be expected that it will appreciably decrease the output of other textiles, but on account of its relative cheapness it has claims that neither manufacturer nor humanitarian can well disregard. Literally, it is a new yarn, and the commercial success already attained by its discovery seems to demonstrate its practical utilization.

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PULP AND PAPER IN FINLAND.

The pulp and paper industries of Finland are increasing in importance every year. Acording to the official figures the production of wood pulp by the sixteen wood-grinding establishments is estimated for this year at about 33,000 tons, thus recovering the loss reported for 1906 and slightly exceeding the figure of 1905. The four concerns already producing chemical pulp showed in 1905 an aggregate of 15,000 tons, which was increased to 20,000 in 1906, and will this year doubtless amount to 24,000 tons. Adding to this quantity the product of the recently erected cellulose factories (say, 16,000 tons), a total of 40,000 tons a year is in sight, or practically double last year's output.

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—The Great Northern Paper Co.'s new plant at East Millinocket, Maine, will have in their new mill one 8-ton, 51-foot span, and one 15-ton, 47-foot span, Northern hand-power cranes. These cranes have been furnished and installed by the Northern Engineering Works, Detroit, Mich.

THE RUTH CENTRIFUGAL SCREEN.

The Manson Mfg. Co., Thorold, Ont., announce in this issue that they are ready to supply Canadian pulp and paper manufacturers with "Ruth Centrifugal Pulp Screens," of which they are the Canadian patent holders and sole manufacturers in Canada. They have made an excellent start by installing two of these screens in the well-known pulp mill of James Davy at Thorold, and according to Mr. Davy's own report they are giving entire satisfaction.

That the Ruth Screen has exceptional merits is shown by the fact that it is patented in practically every pulp and paper-making country of note in the world, including Canada, United States, Finland, Norway, Sweden, Russia.

A brief description of the screen is given herewith, and in following the same the reader is advised to turn for reference to the cut on page 35 of this issue.

On a strong and well ribbed foundation stand four pillars, carrying a cast iron bowl, which is divided into two parts by a curved partition wall, provided with a circular groove on the top. The outside division of the bowl is surrounded by a high cylinder, (visible in the cut) which serves as a receptacle for the screened pulp, which, through the oval outlet pipe, flows direct to the wet-machines, bleaching tanks, or stuff-chests. In the groove on top of the partition wall rests the screen plate drum and it is not fastened in any other way. It consists of two rings, which by light stay rods are kept as far apart as the width of the screen plate; the bottom ring resting in the before-mentioned groove, and the top ring, provided with two handles, standing free. The perforated copper screen plate in one continuous piece is rolled around these two rings and fastened to the same in a very simple, steady and durable way, while the two ends are joined in one vertical seam. The top of the screen plate drum has a close and tight cover, having in its centre the inlet mouth, extending through and above the outside cover, made in two parts, each provided with handles. On this inlet mouth rests the inlet pipe or elbow, which can be turned in any direction to connect with the stock supply pipe. On the inside of the screen plate drum, keyed to an upright shaft, rotates, with not too high speed, a conical runner, having wings so shaped that they form channels between the wings and the conical runner, the whole forming but one wheel, being entirely open without any partition walls or openings and therefore giving no chance for clogging.

The liquid pulp, entering through the inlet pipe, passes between an inner and outer hood, fastened in the inlet mouth. On account of the circular shape of these hoods, the pulp is deflected from the centre and distributed in a circular stream over the channels, which by their peculiar shape in connection with the wings and the centrifugal force, distribute and throw the pulp uniformly over the whole screen plate surface, whereby the fine pulp and the greatest part of the water pass through the perforation of the screen plate and flow out through the oval outlet pipe, while the coarse screenings fall down on the inside of the screen plate and are continually carried off by an opening at the bottom, connected with a pipe.

The above is a brief description of the simple construction and operation of the screen. The attendance is simplified and facilitated in the best possible manner, and it is therefore reduced to next to nothing. By disconnecting the inlet pipe from the supply pipe, lifting it off, then removing the outside cover, which is made in two halves, resting loosely on the top of the outside cylinder,—the whole screen plate drum can easily be lifted out by two men, exposing the runner and the interior in all parts, and inside of a few minutes all these parts can be replaced, the pipe connection made, and the screen is ready to run. The upright shaft rests in a footstep with ball bearing and bronze bushing, while the upper part of it is held in position by a long babbitted sleeve and ball-bearing thrust collar, which all secure a long life with little friction to the moving parts. The horizontal shaft with tight and loose pulleys rests in two ring oiling bearings, and the core wheel drives the pinion with machine cut teeth, all of which secure a steady and noiseless motion. The machine can also be built with bottom pulley drive, or for motor drive. The manufacturers claim for the screen that it requires only ¾ horse-power per ton. It can be connected in any direction, making a saving in piping and spouting. It is self-cleaning, and will screen the maximum amount of pulp per square foot, and screen plate surface.

The "Ruth Centrifugal Screen" is no experiment. It has developed during a number of years, and several hundreds of these screens are working to-day in European mills. Since its introduction in the United States mills, it has met with great success, having entirely replaced old screening systems in a number of mills. Most of these mills, having once learned to value the merits of the Ruth Screen, have throughout adopted the Ruth system as they thereby obtained a better quality of the screened pulp and a considerable saving in fibre and running expenses.

Following is a list of mills, using the Ruth Screen:—Friend Paper Co., West Carrollton, O.; York Haven Paper Co., York, Raven, Pa.; Marinette & Menominee, P., Co., Wis.; Hinckley Fibre Co., Hinckley, N.Y.; Carthage Sulphite Pulp Co., Carthage; DeGrasse Paper Co., Pyrites, N.Y.; Tomahawk Pulp and Paper Co., Tomahawk; Grand Rapids Pulp & Paper Co., Wis.; Menasha Paper Co., Ladysmith, Wis.; Niagara River Mfg. Co., Niagara Falls; Gould Paper Co., Lyons Falls, N.Y.; International Paper Co., Lyons Falls, N.Y.; Champion Paper Co., Carthage, N.Y.; Carthage Tissue Paper Mills, New York; Jefferson Power Co., Black River, N.Y.; Taggarts Paper Co., Great Bend, N.Y.; Prownville Paper Co., Brownville, N.Y.; Aldrich Paper Co., Emeruville, N.Y.; Aldrich Paper Co., Natural Dam, N.Y.; Johnston & Son, Port Leyden, N.Y.; Davy Pulp Mills, Thorold, Ont.

The Manson Mfg. Co., have an extensive plant at Thorold, and are making centrifugal pumps, and other lines of pulp and paper mill machinery.

CANADA COATING MILLS.

A representatitve of the Pulp and Paper Magazine, on a visit to the Canada Coating Mills, Georgetown, Ont., a short time ago found the mills extremely busy. Night and day shifts have been running during the past month. A. M. Huestis, the manager of the company, and L. E. Fleck, the superintendent, were full of enthusiasm for the prospects for a continuance of the activity which is now distinguishing this up-to-date paper mill. The prices of coated stock are to be increased owing to the increase in price of raw material. They are putting in a new super calender and a new coating machine. The company has just finished work on a large catalogue contract calling for six car-loads of paper. The increase in the mill's business since the corresponding month of last year has been no less than 125 per cent.

CANADIAN PAPER IN JAPAN.

The Commercial Agencies Section of the Dominion Department of Trade and Commerce has received an important report from Alexander Maclean, Canadian commercial agent in Japan, in which among other things Mr. Maclean himself expresses his pleasure at seeing one day on the Broadway of Tokio several waggons laden with news paper labeled from the factory of the J. R. Booth Co., Ottawa. Incidentally, Mr. Maclean reports that while a few years ago Canada exported no news paper at all to Japan, last year the official returns showed a total amounting to no less than 45,000 yen, all of it from the Ottawa district.

SIZING AND DRYING PAPER.

It has been stated that a badly-sized paper intended for water colors has been made good by a short exposure to a heat of 110 degrees C. in a drying-room, and the result is explained on the hypothesis that the treatment imparted tenacity to the size, because the temperature exceeded the fusion point of the rosin which had been used. It is remarkable that in such cases nobody thinks of anything except the size, or has any regard for the main constituents of the paper in question. It is, nevertheless, essential to approach the matter from another point of view, and to ask, first, why—the usual amount of size having been used—the paper turned out insufficiently sized. When a paper is intended for water-color drawing we require not only a good sizing, but a perfectly flat surface, which is not crinkled by the painting.

To produce such a paper a pulp must be employed which has not been too severely ground, otherwise the fibres will be crushed, and this will cause a loss of size on the sieve. But paper which has been badly sized on account of deficiencies in pulp, as just stated, can be easily put right by damping it and drying it folded, but unstretched in a drying-room. This is a process well known to paper-makers, and some of them over-grind their pulp purposely to save size. In this way they prepare a paper which lies very flat and has a fine white color. It is then cut into sheets a little larger than will be eventually required, and the sheets are packed between damp felts, so as to take up about 12 or 15 per cent. of moisture. It is then dried and hung up in the drying-room. The temperature of this room must be distinctly higher than is required for paper sized with animal size. The latter needs a heat of 88 degrees F at the most, while for the rosin sizes the temperature must be from 111 degrees F. to 133 degrees F. The heat required for any given kind of paper is learned by experience in drying small quantities. The rapid drying causes shrinking often to the extent of over 1 per cent., according to the kind of pulp used, the way in which it has been manufactured and the thickness of the paper. After the dried paper has cooled and absorbed atmospheric moisture it remains not only well sized but stronger and tougher than it was before. This will explain the circumstance mentioned at the beginning of this article. The paper had only the ordinary hygroscopic moisture of about 8 per cent.; but when the sheets were suddenly exposed to a temperature of 110 degrees C. the fibres shrank at the heated places, so that the size-coat forming the surface of the paper became close enough. This result, however, cannot be achieved unless the paper is unstretched, and the sizing would not be improved if the roll of paper was carried over a heated cylinder coated with a stretched felt, for the paper cannot then shrink enough to form a close surface.

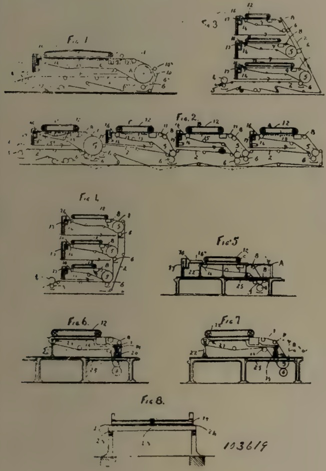
The present case shows that the theory of sizing with uncombined rosin may lead to false deductions, and, besides, there is a real danger attached to it which may inflict loss upon a paper-maker. Continual efforts are being made to increase the uncombined rosin content of rosin soaps, so as to economize alum. The result of this is that the manufactured paper itself contains free rosin. Such paper may seem properly sized at first, but in time the effect is lost, and finally the paper becomes completely unsized. Most large paper dealers and makers have at the present time paper in stock which has undergone this change. To prevent this trouble care must be taken that the rosin soaps used do not contain more than about 35 per cent. of free rosin, because if that percentage is exceeded the alum becomes ineffective. Hence, some of the rosin remains uncombined, whereby the sizing is gradually destroyed because the free rosin neutralizes the acid present in the paper, and necessary for the sizing.—Papier Fabrikant.

PAPER AND PULP-MAKING MACHINE.

The following is a description of a patent recently granted at Ottawa to Samuel Milne, Edinburgh, Scotland, 12th February, 1907; six years. Receipt No. 121,497:—

Claim.—1. A paper-making machine having Fourdrinier wires in combination with a single felt passing below said wires, the wires coming in contact with the felt so as to deliver their webs on to the felt.

2. A paper-making machine having Fourdrinier wires in combination with a single felt passing below said wires, one or more inner couch rolls so arranged that the under side of wire is brought sufficiently low down to meet the felt passing underneath.



3. A paper-making machine having Fourdrinier wires in combination with a felt having couch rolls under the wire and inside the felt, the wire being in contact with the felt at the roll, whereby the paper is transferred directly to the upper side of the felt.

4. A paper-making machine having Fourdrinier wires in combination with a felt having couch rolls under the wire and inside the felt to deliver the paper from the under side of the wire direct to the upper side of the felt with the wire side uppermost to come first in contact with the top press roll.

5. A paper-making machine having Fourdrinier wires in combination with a felt and press rolls, arranged whereby the paper passes under the wire directly on to the felt with the wire side upward, the paper being supported and carried by the felt from the wires to the press rolls.

6. In paper-making machines of the Fourdrinier class, beams 19 and 21 and side bars rigidly fixed thereto, and a pin 23 mounted in the centre of said beam 19, in combination with movable supports carrying the breast roll end so that the wire frame is capable of receiving a swinging motion round pin 23.

7. In paper-making machines of the Fourdrinier class, a crossbeam 20 and a bar 21 arranged inside the wire in combination with and carrying side bars and other parts which come within the part of the wire from said beam 20 and bar 21 placed inside the wire, whereby a wire can be slipped on without removing these parts.

* * *

—A report of the Department of Lands, Forests and Mines, Canada, states that the total area of land under timber license in Ontario is 20,063 square miles. The principal items of last year's output from territory under license were as follows: Saw-logs, pine, 674,800,465 feet, board measure; other than pine, 66,945,987 feet, board measure; square timber, pine, 638,228 cubic feet; other than pine, 18,617 cubic feet; pile timbers, 648,609 feet, board measure; cedar, 126,172 pieces; pulpwood, 84,961 cords. The pulpwood output of 84,961 cords was 12,285 cords in excess of 1905. A bulletin dealing with the growth of manufacturing in Canada, issued by the Canadian Census Bureau, shows the following amounts of capital invested in manufactures in 1900 and 1905 for paper and pulp:—

	1900.	1905.
Paper	7,507,819	21,260,157
Wood pulp	11,585,560	11,164,768

THE SITUATION IN SCANDINAVIA.

C. E. Sontum, Canadian trade agent in Norway, says that the strikes at the pulp and paper mills are still going on, and very likely to continue, as the workmen have refused the owners' offer in regard to higher wages, and the negotiations have been broken off between the Employers' Association and the Workmen's Association. The next step will, therefore, most likely be that the Employers' Association in the paper and pulp trade will declare a lock-out for all organized workmen. The shortage of pulp from this source is becoming alarming. One feature of the situation of interest to Canadians is that since the strikes in Norway, J. R. Booth, of Ottawa, has increased his sales of news to England very greatly.

Big labor conflicts appear to be pending also, he says, at the Swedish paper mills. A tug-of-war between employers and workmen in the paper trade has a long time been anticipated. At some mills the strike is already going on. When the struggle has commenced, it is not improbable that it may reach big dimensions, and that all the mills may be involved. It is possible that the employers will also in Sweden meet the strike by declaring lockout.

Several thousand hands are now idle. One of the largest mills, the "Borregaard," has alone had about 2,500 workingmen, who have all been discharged until the matter is settled. This will, of course, set the production back considerably. The negotiations which have been carried on between the workingmen and the mill owners have not led to anything. The report states that the export of wood pulp from Norway has been gradually increasing in the last forty years, jumping in that time from 60 to 500,000 tons annually.

Of the wood pulp export from Norway in 1906 there was of mechanical (dry), 13,059 tons; of mechanical (wet), 362,229 tons; of chemical (dry), 122,416 tons; of chemical (wet), 7,416 tons. The United States received 60 tons of mechanical dry pulp and 19,217 tons of chemical dry pulp, and Great Britain purchased over half the total quantity of the exported pulp-wood.

M. Villiers, British Consul in Stockholm, also refers to the growth of labor organizations in Sweden. Pasteboard was exported from Sweden in 1906 to the amount of 13,322 tons, and paper of all kinds 124,155 tons, as against 13,050 tons and 108,625 tons, respectively in the previous year. The imports of paper of all kinds into Sweden during 1906 were 2,494 tons, and in 1905 2,336 tons.

The latest report from Europe is that a general lock-out of all the workmen in the sulphite, soda, and paper mills of Norway and Sweden has been declared and that the mills are completely shut down. About 7,000 men in all are affected.

WOOD FLOUR.

Considering the numberless uses to which wood flour can be put, it is curious that Canadians do not more speedily become interested in its manufacture, for which this country possesses several manifest advantages. In the first place it has vast stores of raw material, probably far more than any other country; also, its manufacture in Canada would be protected by a fair duty. It is already made in two or three mills in the United States, but the chief source of supply at the present time is Scandinavia, which, in regard to wealth of raw material, is situate more or less similarly to Canada. The chief uses for wood flour at the present time are as an ingredient of explosives and for filling material for linoleums and similar goods; but these uses would no doubt be found to quickly multiply with greater abundance of the material. Even as it is, the market is certainly large enough to absorb any quantity likely to be produced within a reasonable period from now. It may be added that the price of a plant for turning out wood flour is not large, and the cost of operating it comparatively small.

COOLING OF SULPHUROUS ACID GAS IN SULPHITE MILLS.

In the manufacture of sulphite lye it is important that the gaseous sulphurous acid should not be at too high a temperature when it enters the tower or vat. In the cooling of gases, which under ordinary circumstances are not condensed into a fluid state, the difficulty arises that the reduction of temperature is not transmitted between the molecules with sufficient rapidity. The cooling apparatus should not occupy too much room, and should not consume too much cooling water; while the pipes conducting the gas should not be too narrow. The latter precaution is necessary so that they may convey sufficient gas and may not be easily stopped up by sulphurous deposits and flying dust.

With a view to obviate these difficulties, relatively wide pipes have been in some cases used, being conducted upward and downward, and air cooling being combined with water cooling. This system was not found satisfactory, owing to difficulty in cleaning and the quick wearing out of the lead pipe.

Other trials established the fact that the previous method of sending water through gas pipes was wrong, and that it was preferable to place in the current of gas a certain number of water pipes, with a view to the fullest utilization of the water and the quickest and maximum cooling of the gas, the cooling apparatus thereby requiring a minimum amount of space.

In Turk's cooling tower system the sulphurous acid is conducted downward through a cast iron cylinder resting on four feet. In this cylinder are rings on which lead pipes rest, the water flowing upward through the latter. By suitable arrangements not only is the water fully utilized, but the current of gas is kept so thoroughly in motion that a rapid and uniform reduction of temperature is effected.

An instance is quoted in which for a consumption of about 1,700 kilos. (3,740 pounds) of sulphur, a tower is used, 4 metres (13.12 feet) in height and 1.3 metres (4.20 feet) in diameter, with approximately 30 square metres (322.80 square feet) of cooling surface. The SO_2 gases are brought down from about 300 degs. C. (572 degs. Fahr.) to 40 degs. or 50 degs. C. (104 degs. or 122 degs. Fahr.), with a consumption of cooling water amounting to 0.3 liter (0.08 gallon) per second.

Any sulphuric acid which may be present falls to the bottom of the cylinder, where it can be removed. The purification of the tower from sulphurous deposits and flying dust can be most rapidly effected by means of jets of water.

Various difficulties which have hitherto been experienced in connection with the preparation of lye are said to be obviated by placing as many cooling towers as are necessary in close proximity to each other.

TRADE ENQUIRIES.

The following enquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these enquiries, with their addresses, can be obtained upon application to Superintendent of Commercial Agencies, Department of Trade and Commerce, Ottawa, or publishers "Pulp and Paper Magazine":—

811. **News-pulp Boards.**—An Irish firm of wholesale stationers, bag and box makers is desirous of being placed in touch with makers of "news-pulp" boards in Canada.

815. **Wood Pulp.**—A Liverpool firm interested in Canadian business generally desires to correspond with wood pulp exporters in the Dominion who are represented in Great Britain.

855. **Cardboard.**—A Belgian firm desires the addresses of Canadian manufacturers of cardboard.

857. **Agents.**—A Scotch firm manufacturing account books and other stationery goods is open to appoint Canadian resident agents.

PULP AND PAPER NEWS.

(Continued from Page 175.)

George H. Millen, co-manager of the E. B. Eddy Company, Hull, is on a business visit through the West, with a view, we believe, to sizing up the situation for a branch business, probably in Alberta.

* * * *

Quantities of rossed wood are being taken down to New York mills by rail by way of the Quebec, Montreal, and Southern Railroad. From the lower St. Lawrence pulp-wood is also being brought by barge for the use of the Dexter N.Y. mills.

* * *

Mr. Murray, a timber importer for the Province of British Columbia, is investigating into alleged wholesale illegal cutting of timber on valuable pulp leases, owned by the Pacific Pulp Company, on Guildford Island, north-east of Vancouver Island. That district contains some particularly valuable pulp-wood.

* * * *

The Edward Partington Pulp and Paper Company, successors to the Cushing Sulphite Fibre Company, St. John, N.B., are putting in a new digester, thus increasing the capacity of the mill by thirty-five per cent. The company is also building large new offices, and is being incorporated under its new name. The mill is running to its full capacity, shipping the major portion of its output of 45 tons a day (dry) to the United States.

* * *

As a result of negotiations with the Temiskaming and Northern Ontario Railway Commission, J. R. Booth, Ottawa, will construct a private siding at Latchford for the accommodation of cars carrying supplies for the working of his pulp-wood concession on the Montreal River. Negotiations are now proceeding between the railway commission and some Michigan pulp manufacturers for the carriage of pulp-wood cut by farmers along the line of the railway.

NEWS OF THE MILLS.

(Continued from Page 176.)

Geo. H. Perley, M.P., for Argenteuil, P.Q., and a well-known manufacturer of pulp, gave a picnic to his constituents last month, which was a great success. It was held near Calumet. There were the usual picnic diversions, speech-making, etc., but of a non-political character.

The deal for the purchase of the Spanish River Pulp Mills by the Wisconsin syndicate, headed by E. A. Edmonds, was completed on the 16th ult., the purchasers having paid $100,000 cash, and arranged for the payment of $1,060,000 on January 1st next. The balance of $1,000,000 will be paid later.

The Belgo-Canadian Pulp and Paper Company, Shawinigan Falls, P.Q., has given an order to the Pusey & Jones Company, Wilmington, Delaware, for a Fourdrinier paper machine 154 inches in width and with a capacity to make 500 feet of paper per minute. There will be thirty driers four feet in diameter. The machine will have wire of the greatest length ever placed on such a machine. It will also have a set of chilled iron calender rolls 26 inches in diameter and supplying heat enough to dry the paper and give a high polish.

A motion was made on 20th ult. before Judge Riddell at Toronto on behalf of J. B. Clement, of New York, who owns $10,000 worth of the debentures of the Imperial Paper Mills Company, asking for a declaration of his rights, and discontinuance of the receivership. The motion was opposed by C. N. Marsden on behalf of the company, as the receivers, he claimed, were very successful in rearranging the company's affairs. One point Mr. Marsden dwelt upon was the fact that the shareholders are mostly residents of England, and the English courts had sanctioned the issuing of $400,000 of bonds in priority to the company issue of $250,000 worth. Most of the creditors had expressed a willingness to take these bonds in settlement of their claims. The holders of the second issue of bonds were also agreeable to this arrangement.

THE MARKETS.

August 17, 1907.

Pulp.—To add to the great firmness of the market come reports of low water, owing to lack of precipitation and excessive heat last month. Some drives of logs have, it is said, been abandoned, owing to this cause. Prices for ground wood are held at such a high range that some mills in the United States have been holding off as long as possible, and yet the practically universal opinion is that, to get the goods they will have to give the price. The serious news from Europe of a general lock-out in Norway and Sweden will before long show still stronger effects on the pulp market on this continent. Ground wood fetches almost any price just now that there is a scramble to get it for immediate requirements, but the general quotation would probably range around $18 to $22. Sulphite has practically reached $2.50 as a market quotation. We hear of one Canadian mill wanting a quantity of foreign bleached sulphite.

Paper.—The prophesied hot weather dullness did not materialize, or if so it was but barely perceptible. Some mills are said to be behind on all classes of orders. All lines of paper are firm, though there have been no set advances during the month. Collections are said by some to have been a little slow, more particularly in the West. Wrappings are very strong, and it is not unlikely there will be further advances in that, and perhaps in book and writings within the next month.

British.—Sulphite pulp, easy bleaching qualities, is well sold and prices for this and next year are very firm, says World's Paper Trade Review. Strong sulphite is scarce, and advancing in value. Soda pulp is difficult to secure, there being little unsold for this year. Mechanical pulp 50 per cent. moist, has now reached 61s. c.i.f. Great Britain, and there is nothing to prevent it going higher as there is a good enquiry. The quotations for 1908 are 52s. 6d. to 55s. c.i.f. Great Britain.

Chemicals. — The market continues steady. Ammonia alkali stands at £4 10s .to £4 15s; bleaching powder (soft wood), £4 12s. 6d; caustic soda, 76 per cent., £10 10s.; soda crystals, £3 2s. 6d.; salt cake, £2 f.o.r.; recovered sulphur, £5.

PAPER STOCK MARKET REPORT.

Montreal, August 17th, 1907.

The market for paper stock is very firm, with an active demand. There is a good demand for cotton rags, especially from the United States.

Roofing stock is scarce and firm. Stocks of waste are in small compass.

Quotations are as follows:—

Unbleached cuttings	4.50	to	5.25
White shoe clips	4.50	to	5.00
Colored shoe clips	3.25	to	3.75
Domestic white rags	2.50	to	2.75
Blues and thirds	1.25	to	1.50
Roofing stock	.90	to	1.25
Manilla rope	3.75	to	
Waste papers	.35	to	.40
Bagging	.90	to	1.10

THE KILLARNEY OF AMERICA.

Nestling in a frame of beautifully wooded shores lies a series of beautiful lakes 145 miles north of the City of Toronto, Ont., and known as the "Lake of Bays Region." A chain of seven lakes studded with lovely islands, with hotels throughout the district and a good steamboat service to all points attracts the tourist, angler, and sportsman. Just the out-of-the-way sort of place to visit during the summer months. For all particulars and free illustrated publications apply to J. D. McDonald, Union Station, Toronto, Ont.

GREAT NORTH COUNTRY.

Nimrod was a mighty hunter, but had he hunted in the "Temagami" region he would have been a mightier one. Nimrod hunted for glory, but Temagamins hunt for game. Those Indians who made the first canoe of birch bark long ago, were our greatest benefactors. The children of these Indians know the canoe and they know how to use it, and if you go to Temagami this summer they will paddle your canoe in their own superb way. They will be the best guides you ever had. Students who camp in summer along the Temagami lakes are able to do two years' work in one. Finest of fishing and hunting. Easy of access by the Grand Trunk Railway System. For information and beautiful descriptive publication sent free apply to J. D. McDonald, Union Station, Toronto, Ont.

YOUR SUMMER OUTING.

If you are fond of fishing, canoeing, camping or the study of wild animals look up the Algonquin National Park of Ontario for your summer outing. A fish and game preserve of 2,000,000 acres interspersed with 1,200 lakes and rivers is awaiting you, offering all the attractions that Nature can bestow. Magnificent canoe trips. Altitude, 2,000 feet above sea level. Pure and exhilarating atmosphere. Just the place for a young man to put in his summer holidays. An interesting and profusely illustrated descriptive publication telling you all about it sent free on application to J. D. McDonald, Union Station, Toronto, Ont.

* * *

—The semi-annual convention of the National Paper Trade Association of the United States, which took place on the 26th and 27th ult., was a very successful affair. The general verdict of those who took part in the proceedings was that trade has been good and in fairly satisfactory condition for the past year, and that what was needed throughout the whole country was greater interdependence and sense of harmony of interests.

—The Ottawa Pulp & Paper Company expects to start work within a month, at the Chaudiere, making pulp from spruce and hemlock refuse, and shipping it to Massena, N.Y.

—Dr. Wilfred T. Grenfell, the author and missionary, writes from North Newfoundland to a St. John's paper, stating that practically "every acre of tree-bearing ground on that northern spur of country is being applied for to be cut up for pulp."

—The manufacure of bread from wood pulp is one of the latest industries started in Berlin, and about 500 quintals per day are being turned out. At present it is only used for feeding horses, and the manager of the Berlin tramway system says it has been found very nourishing. The pulp is put through a chemical process of fermentation, and mixed with a third of the quantity of farina from rye. The resultant mixture is then baked like ordinary bread.

—In view of the strikes at paper mills, both in this country and the United States, it is interesting to note that Secretary Chable, of the American Paper and Pulp Association, who sent out a circular recently as to the working hours in force at the paper mills in the United States, has now received replies from 287. Of these, 8 have a system of one tour shifts, 29 of three tours, and no fewer than 215 of two tours, while 35 did not state. This statement shows a fair average, and includes a majority of the larger mills.

—A great merger of paper mills in the States of Wisconsin, Minnesota and Michigan, with a capital of $30,000,000, is now being engineered by J. G. Hanrahan. One of the controlling elements in the formation of the merger is said to be the need of large reserves of pulpwood. We understand that representatives of the organization are now in Canada with a view to the selection of the same. Several mills are understood to have already expressed their readiness to form part of the new organization.

COLORED PAPERS FOR DYE

The analysis of colored papers is partly physical and partly chemical, says L. Kollmann in "Paper and Pulp." It includes the determination of the nature of the fibre, of its strength, of the weight of the paper per square metre, and of the size, filling and dye which have been employed.

The color has little influence on the physical tests. The nature of the fibre is ascertained with the microscope, as with undyed papers. A sample of the paper is soaked with a 5 per cent. solution of caustic soda for a time. The lye is then diluted with its own volume of water, and the whole is boiled till the paper is entirely disintegrated. The size dissolves; mineral fillings settle to the bottom or are dissolved. The mass is now filtered through a fine wire sieve, and the fibres are rinsed and microscoped. The treatment with caustic soda may or may not destroy the dye. If it does not, and the solution is not too dark, the microscopical examination will not be interfered with, except that it is then impossible to test the mechanical pulp by the usual color tests. This matters little, however, for anyone with some practice can recognize it by the eye. When the solution is so dark that the structure of the fibre is hidden, the dye must be destroyed before microscoping. This is done with various reagents, such as alcohol, hydrochloric acid, and bleaching powder, care being taken not to destroy the fibre as well. Boiling with dilute caustic soda destroys Prussian blue and many basic dyes, leaving the fibre brown or pale yellow. Hydrochloric acid destroys most inorganic coloring matters and natural dye-stuffs, and many artificial dyes. Nitric acid is even more effectual, and bleaching powder or sodium hypobromite bleaches energetically. A few colors, such as chrome-logwood black, are very obstinate. Black paper so dyed has been treated with hydrochloric acid, first dilute and then strong, with nitric acid, caustic soda, tin salt and hydrochloric acid, sodium hypobromite, bleaching powder, and chromic acid, as well as with hot dilute aqua regia, with the result in each case that the fibre suffered much more than the dye.

Strength is determined by the well-known methods. Dyeing ought not to affect the strength of a paper, but an excess of mineral matter, whether pigment or filling, lessens it materially. Dyes do not affect the absorbent power of a paper.

The chemical testing is directed to the determination of the coloring substance which has been used. The question is easily answered in the case of some dyes, such as metanil yellow, and, of course, in the case of mineral pigments. At other times the determination is extremely difficult. It may, for example, be impossible to say more than that some red azo dye has been employed. When, too, several dyes have been combined, the chemist is often completely baffled, and all that can be done is to get an experienced dyer to judge from physical characters as well as he can.

The fact that most organic dyes can be stripped by boiling water facilitates matters very much, for then the dye can be isolated for separate examination. The following is an example of the method:—

Tear up small about 100 grammes of paper, and boil it in alcohol in a flask or a reflux condenser. This must be done before the stripping with water, so as to extract the size which would otherwise protect the dye from the water. Of course, the alcohol treatment is omitted with unsized paper. The paper is now boiled with from three to five lots of water, taking each time only just enough to cover the paper. This is done in the same flask after pouring off any alcohol that may have been used, and also with the reflux condenser. The watery extract is mixed with the alcohol extract (if any). Three cases may occur: (1) The dye is entirely stripped, or very nearly so. (2) The dye is partly stripped, what remains on the fibres showing the same color as at first or not. (3) The dye is not stripped. To make sure of this, the solution is filtered, as the presence in it of minute fragments of fibre deceive the eye as to the stripping action. In the first two cases the mixed solutions are evaporated down to one-half on the water bath, filtered, evaporated some more, and then precipitated by saturating it with common salt. The dye is thrown out at once or after a time. It may precipitate slowly without any salt. The precipitated dye is filtered off and dried. To see whether it is a single dye or a mixture, make a not too dark solution of a little of it in water, and hang up a strip of filter-paper so that it is partly immersed in the solution. If the latter contains more than one dye they will usually be absorbed to different heights, so that the strip will show bands of different colors crossing it. If it is found that there is only one dye, dissolve some of it in as little water as possible, and mix it with "tannin-reagent," which is made by dissolving equal weights of tannin and sodium acetate in ten times the weight of either of water. If there is a precipitate we have a basic dye, if not an acid dye. In the former case mix the strong solution of the dye with concentrated hydrochloric acid and zinc dust, and boil till the color is destroyed. Then neutralize exactly with caustic soda, filter, and put a drop of the filtrate on to white filter paper. If the original color soon reappears on drying, we draw the following conclusions:—

(a) The color is red: the dye is an oxazine, thiazine, azine, or acridine dye, e.g., safranine. (b) It is orange or yellow: the dye is as in (a), e.g., phosphine. (c) It is green: the dye is as in (a), e.g., azine green. (d) It is blue: the dye is as in (a), e.g., Nile blue, new blue, fast black, or methylene blue. (e) It is violet: the dye is as in (a), e.g., mauveine.

If the original color does not reappear on drying, but does so if padded with a 1 per cent. solution of chromic acid, we draw the following conclusions:—

(a) The color is red: the dye is rhodamine or fuchsine, or one of their allies. (b) It is green: the dye is malachite green, brilliant green, or one of their allies. (c) It is blue: the dye is night blue, Victoria blue, or one of their allies. (d) It is violet: the dye is methyl violet, crystal violet, or one of their allies.

If the original color does not reappear even with chromic acid, it was originally in most cases a yellow or a brown, referable to auramine, chrysoidine, Bismarck brown, thioflavine, or one of their allies.

If the tannin reagent produces no precipitate, reduce with hydrochloric acid and zine, or ammonia and zinc, and neutralize and filter as in the case of a basic dye. The solution when dropped on to white filter paper may be bleached (a), may have become a brownish red (b), may have been imperfectly and slowly bleached (c), or may have undergone no change (d).

(a) If the color quickly returns the dye is azurine, indigocarmine, nigrosine, or one of their allies. If it returns only on padding with a 1 per cent. solution of chromic acid, warming, and holding over ammonia, some of the dye is dissolved in water mixed with concentrated hydrochloric acid, and shaken up with ether. If the ether takes up the dye, we have aurine, eosine, erythrine, phloxine, erythrosine, or one of their allies. If it does not, we have acid fuchsine, acid green, fast green, water blue, patent blue, or one of their allies. If the color never returns, heat some of the dye on platinum foil. If it deflagrates with colored fumes the dye is aurantia, naphthol yellow S., brilliant yellow, or one of their allies. If it does not deflagrate, or very slightly, dissolve a little of the dye in 100 times its weight of water, and dye a cotton skein in it at the boil for about fifteen minutes. Then rinse and soap the skein vigorously. If the dyeing is fast with this treatment, we have a substantive cotton yellow or thiazine red; if it is not, we have an ordinary azo dye. (b) The dye is an oxyketone, such as alizarine. (c) The dye is thiazol yellow or one of its allies. (d) The dye is thioflavine S., quinoline yellow, or one of their allies.

If the dye is not stripped by alcohol and water, it is either inorganic or an adjective dye, such as logwood black, cutch, fustic, etc.; and we proceed according to the color as follows:—

If it is red or brown, the dyed fibre is dried and divided into two parts. One is boiled with bleaching powder. If it is bleached entirely or to a large extent, the dye is cutch. If the bleach has no action, incinerate some of the dyed fibre in an iron crucible, and heat the ash on charcoal before the blowpipe. If a globule of lead is formed, we have Saturn red. The second portion is boiled with concentrated hydrochloric acid. If there is no action, we have Cologne umber; if there is partial action, we have real umber; if the dye dissolves completely to a yellow solution, we have an ochre; if the solution is colorless instead of yellow, and chlorine is evolved during solution, we have manganese brown.

If the color is yellow or orange, boil with concentrated hydrochloric acid. If we get a green solution and a white residue, we infer chrome yellow or orange. If we get a yellow solution, we boil it with a drop or two of nitric acid and then add some ammonium sulphocyanide. A red color shows an ochre or Sienna earth.

If the color is green, boil with caustic soda lye. If the fibre turns brown, we have chrome green. If no change takes place, boil with concentrated hydrochloric acid. A yellow solution shows green earth; a red color, logwood plus fustic.

If the color is blue or violet, boil with caustic soda lye. If the fibre turns brown, we have Prussian blue. If no change takes place, boil with concentrated hydrochloric acid. A yellow solution shows smalts. If the color is destroyed, and the smell of rotten eggs is developed, we have ultramarine.

If the color is black, warm with concentrated hydrochloric acid containing a little tin-salt. If the black is unchanged, we have a black pigment. If we get a pink to deep red solution, we have logwood black.

By means of the tests above detailed at length the group to which the dye belongs is discovered, and often the actual dye itself. Once the group is known it is generally easy by means of the special reactions given in books to identify the particular dye.

* * *

THE PULP MILLS AT SWANSON HARBOUR.

At Swanson Harbour, about half way between Vancouver and Port Essington, the Canadian Sulphite and Pulp Company, Ltd., has started work on a factory on a site which is nothing but a wilderness of burnt ground and blackened stumps, out of which the framework of a large sawmill is rapidly growing into shape. The sawmill will, when completed, be one of the largest on the coast. In addition to the sawmill the company is planning the erection of a large pulp mill in which the spruce timber, of which an unlimited supply exists in the neighbourhood, will be ground into material for the manufacture of paper. It has now been decided, we understand, to manufacture the paper right on the spot, and plans have been prepared for a great plant in which all grades of paper from the roughest kind such as is used for wrapping purposes, to the finest grade stationery will be turned out.

This plant, with the pulp mill, will be located at the foot of the falls which run into Swanson Harbour, and from which can be secured power sufficient to run the whole concern. They are close on 100 feet in height, and receive a never failing supply of water from a lake situated about a mile inland. A concrete dam will be built across the foot. From this will be secured 500 horse-power units of power for use on the immediate requirements of the company. This, however, is a mere fraction of the possibilities of the falls. So far as shipping is concerned, the facilities of the company are unsurpassed. The entrance to Swanson Harbour is through a narrow land-locked channel. The mountains which ascend straight from the water on either side, entirely shut out the wind, insuring calm, however much the tempests may rave on the Pacific itself.

Altogether, when the plant is ready for operation, docks, mills, and all will represent an expenditure of over half a million dollars. Two hundred and fifty men will be employed in the works.

The limits of the Canadian Sulphite & Pulp Company embrace in all thirty-five square miles of territory, covered with timber, the majority of which is spruce. They are not all in one piece, having been selected so as to lie along the shore line, making their logging an easy matter. The contract for excavation and concrete work for the pulp mill has been awarded to the British Columbia Contract Company.

* * *

THE LA TUQUE PULP MILL.

The plans for large pulp mills at La Tuque, Que., are rapidly taking definite shape. Men are now at work building sawmills, and in the meantime men are engaged in shifting pulp-wood to the paper mills at Berlin, N.H. Contracts have been made for shipping 6,000 car loads per year to Quebec by the Quebec and Lake St. John Railway, thence on the G.T.R. over the new bridge to Berlin. Hundreds of men are now at work in the vicinity grading and blasting for the Grand Trunk Pacific, where there is a branch connecting La Tuque with the Quebec and Lake St. John road. A large portion of the proposed town site of La Tuque has been bought by a hotel man who is cutting it up into building lots.

FOR SALE

Cylinder Paper Machine, 72 inches wide, complete from screen to winder, including steam engine, all shafting and pulleys. Reason for selling, replacing by a larger machine. Will sell cheap to prompt buyer. Apply to "Paper Manufacturer," care Pulp and Paper Magazine, Toronto, Canada.

POSITION WANTED.

Superintendent open for Engagement.

A1 on Book, Bond, Blottings and Coating Stock 17 year's experience in different parts of the Globe. Used to the working of daily cost sheets. Would not object to handling a mill making a lower grade with a view to working it up to Book and Blottings. Highest reference as to ability, character, etc. Address M. R. J. care Pulp and Paper Magazine, Toronto.

Position Wanted

A mill manager, having experience in the manufacture of Kraft Brown both in Sweden and England, is open for an engagement with a Canadian mill. Is able to take charge of a paper mill as manager or assistant manager. Address "Kraft," c/o Pulp and Paper Magazine.

Position Wanted.

Tour Boss for 12 grinder ground wood mill; must be first-class pulp maker, and have good knowledge of machinery. Good wages for right man. Address: "J. A. B." care of the Pulp and Paper Magazine.

THE CANADA COATING MILLS, Ltd.

GEORGETOWN, ONT.

..Manufacturers of..

Surface Coated Book and Lithographic Papers, Coated Cardboards and Coated Boxboards of every description.

THE **Swenson** EVAPORATOR

Boils off Water, not Spent Caustic.
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FOURDRINIER WIRES
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Wire Cloth all meshes, in Brass, Copper Bronze & Steel.
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The John McDougall Caledonian Iron Works Co.
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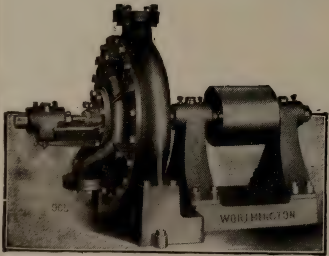

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Water Tube, etc.

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Water Tanks, Penstocks, Steel Riveted Pipe.

Hydraulic Presses:
For Pulp and Paper Mills.

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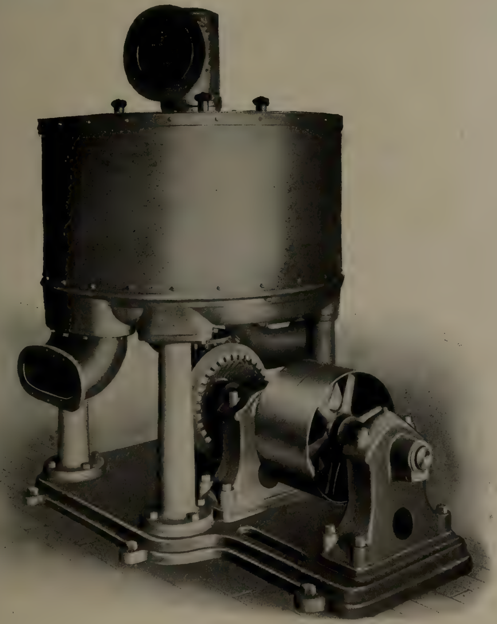

Screens are installed free of all charges for thirty days' trial, and **we have never had a Screen returned from any trial.** One week's work of this Screen will convince you of its merits. All we ask is a fair trial.

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SOLE MANUFACTURERS FOR CANADA.

HOLYOKE MACHINE COMPANY

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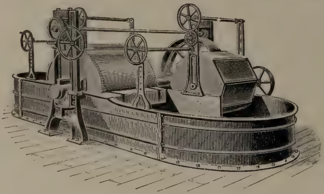

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Hydraulic Pumps and Presses.

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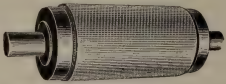
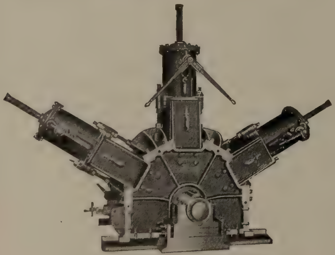


Cotton and Paper Rolls with Patent Fastenings.



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Elevators, Rotary Fire Pumps and Friction Gearing.

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Shafting, Pulleys and Mill Work.

Machinery for Wood Pulp and Paper Mills.

Vertical and Horizontal Water Wheels with Flumes and all connections.

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Newest Designs

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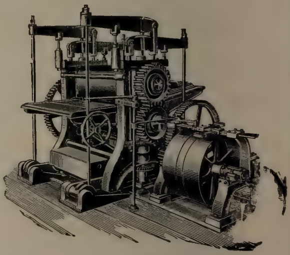
Special Machinery.



Description and Estimates Furnished; also Gear List and Catalogs sent on application.

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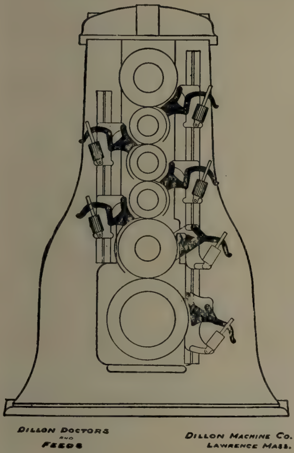

Beating Engines
Washing Engines
Jordan's Three Sizes—Single, Double & Triple
Stuff Pumps, with Dillon Patent Valve Seating
Wet Machines
Horizontal and Vertical Stuff Chests
Single and Double Paper Cutters
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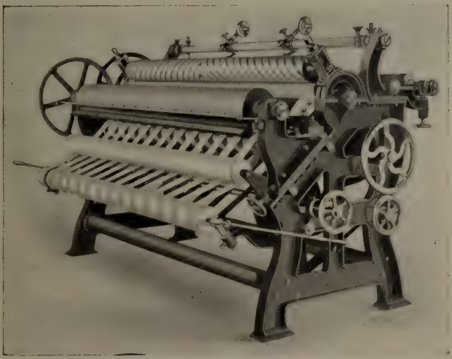

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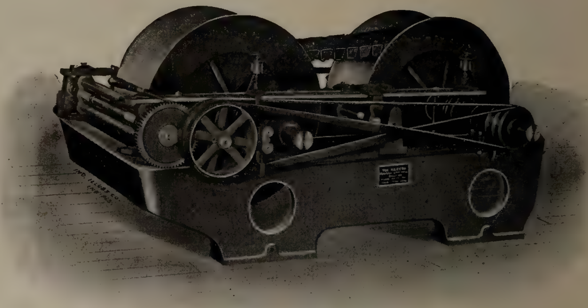

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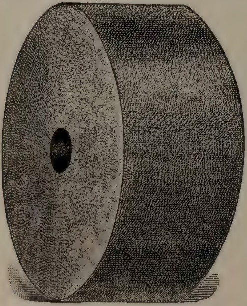

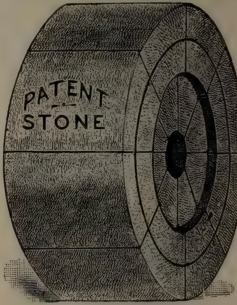

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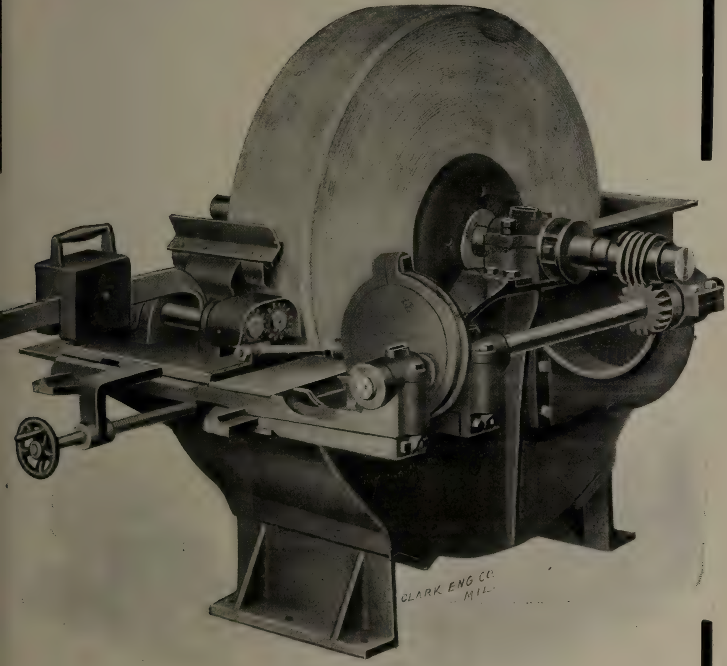

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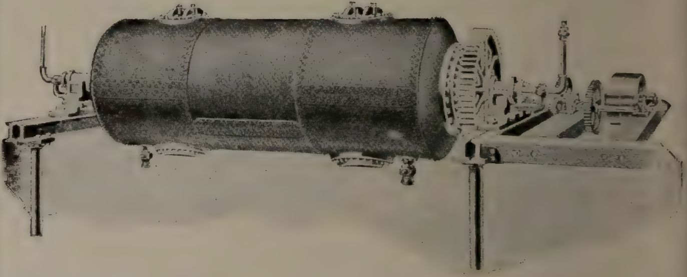

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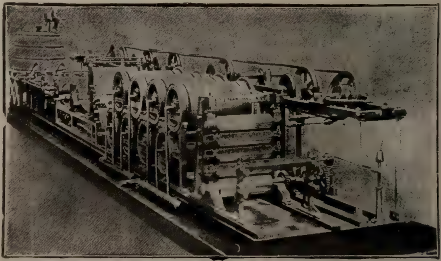

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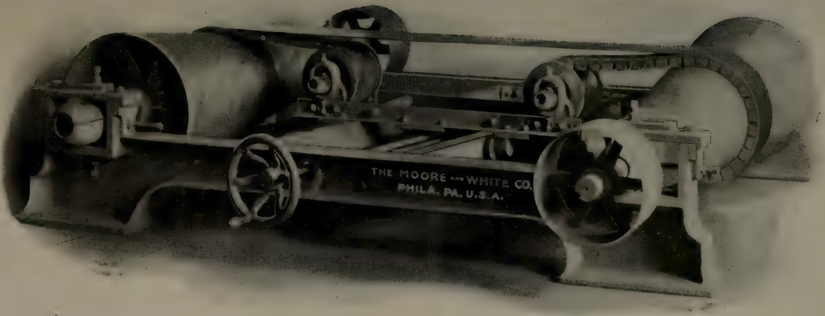

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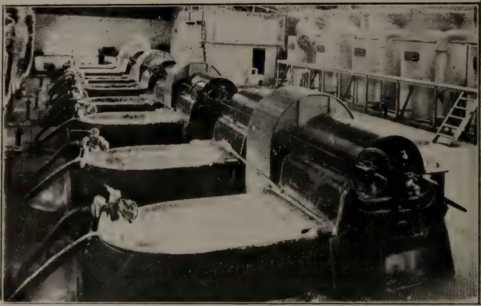

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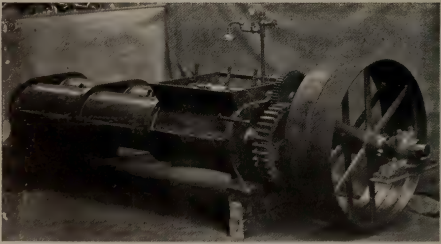

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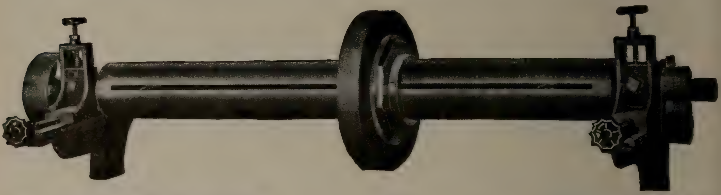

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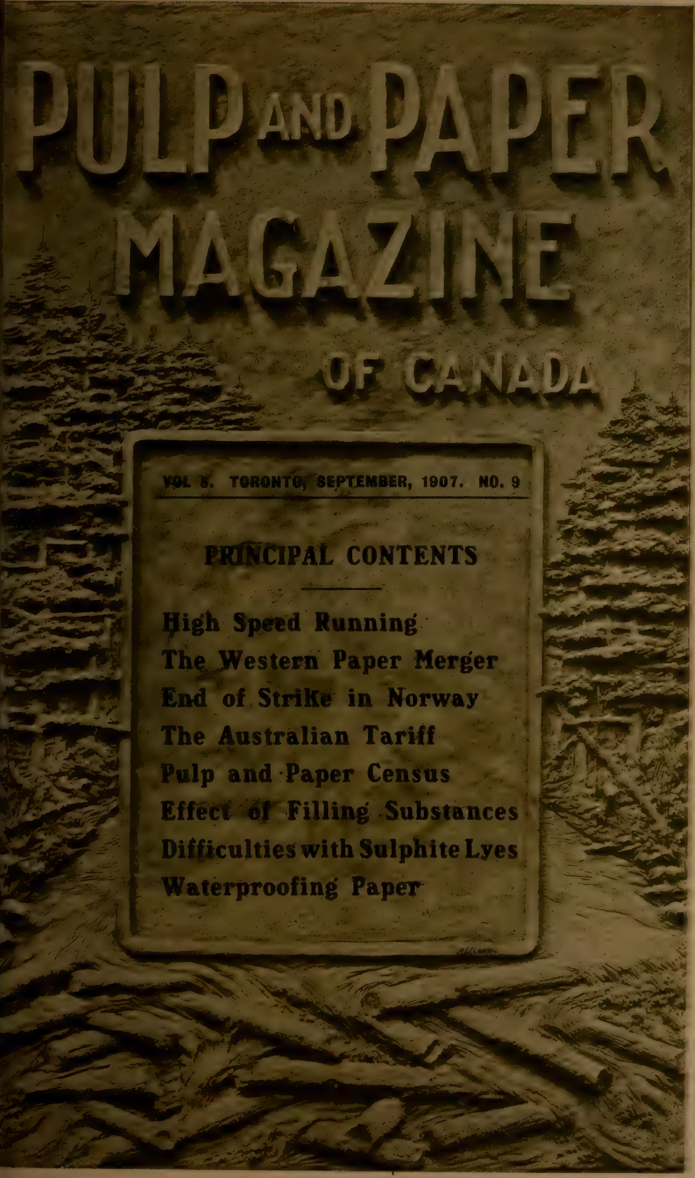

PULP AND PAPER MAGAZINE OF CANADA

VOL 5. TORONTO, SEPTEMBER, 1907. NO. 9

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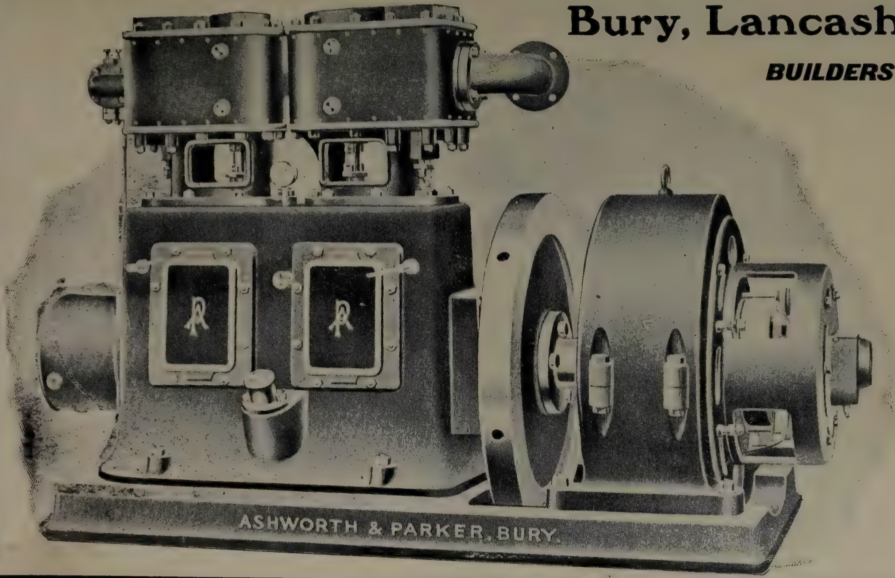

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PULP AND PAPER HANDBOOK OF CANADA.

The Pulp and Paper Handbook of Canada, which is combined with the Canadian Textile Directory, has been issued by Biggar-Wilson, Limited, Confederation Life Building, Toronto. The book contains full reports of the pulp and paper mills of Canada and Newfoundland, as well as the mills projected and in course of construction. The mills are also classified according to the kinds of paper or pulp made in each mill, and there are complete lists of manufacturing, wholesale and retail stationers, paper box, paper bag and envelope manufacturers, wholesale dealers and manufacturers' agents in pulp and paper, exchange tables and a full list of the Canadian Boards of Trade and their officers. The publishing of the Boards of Trade, and other Canadian trade associations is especially appreciated by these organizations, and has resulted in subscriptions to the book being sent by nearly every board in Canada, which is a most valuable circulation for the paper manufacturers, not only because the members of the Boards of Trade are individually large consumers of paper, but because the large representation of announcements brings forcibly before these organizations the importance of the pulp and paper industries in Canada, and the immediate need of an export duty being placed on pulp-wood in order to make these industries the greatest manufacturing asset of the Dominion. Another important feature of the work is the addition of the Canadian and Newfoundland tariffs in the pulp, paper, and textile trades. The publishers announce in this connection that in future two separate directories will be published, one dealing with the pulp, paper, and kindred industries, and the other with the textile industries. The new directory is handsomely bound and printed, and will be mailed postpaid to any home or foreign address at $3 per copy.

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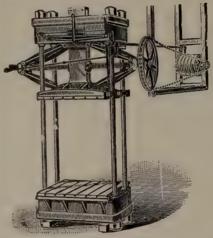

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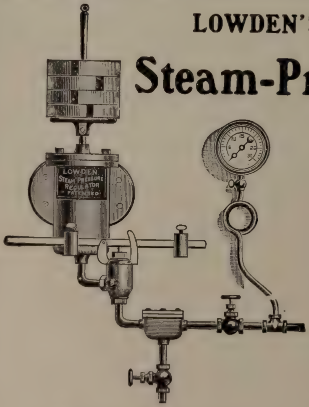

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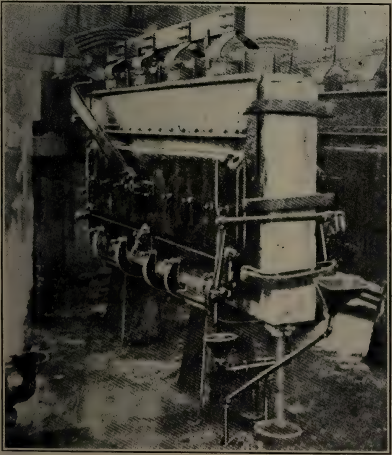

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THE

PULP AND PAPER MAGAZINE

OF CANADA

Vol. 5.—No. 9. TORONTO, SEPTEMBER, 1907. {$1 A YEAR
SINGLE COPY 10

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade.

SUBSCRIPTIONS: Canada, British Empire and the United States, $1 a year; to Foreign Countries, 5s. a year.

The Pulp and Paper Magazine is published on the third Tuesday of each month. Changes of advertisements should be in the publishers' hands not later than the 10th of the month and, where proofs are required four days earlier. Cuts should be sent by mail, not by express.

BIGGAR-WILSON, Ltd.,
PUBLISHERS
OFFICES, CONFEDERATION LIFE BUILDING,
TORONTO, CANADA.

HIGH SPEED RUNNING.

It may possibly be worth while for manufacturers again to go into the question of the speed at which paper machines are most profitably run. Under the conditions which have prevailed in this country during the past year or two it would seem that the chief desideratum would be to run the machines more rapidly rather than more slowly, in view of the pressing demand and of the price at which the product has sold. In the case of the finer paper, of course there is no question of higher speed; quality would suffer immediately. But even with respect to news, the question has recently arisen in Europe as to whether a slower speed, with the resulting better quality, would not be a paying proposition. In some tests recently made in Germany it was found that at a speed of over 500 per minute there was so much wastage that there was less actual profit than with a production of about 350 feet per minute, when practically the whole quantity turned out would be up to requirements. Another consideration which is worth considering by Canadian makers is this. At a lower speed, the percentage of sulphite, it is generally recognized, can be materially reduced, and yet admit of the production of an equal quality of paper. Whether this difference would be sufficient to counterbalance the loss incurred through the reduction of speed is a point on which we ourselves have doubt, but probably there would be individual factors at work to modify the problem at each mill, so the question is one for each manufacturer to look into and settle for himself.

⁂

THE WESTERN MERGER.

An important and significant feature of the main idea underlying the present negotiations for the formation of a gigantic paper merger in Wisconsin and other Western States is the securing of some 100,000 acres or more of pulp-wood land in Quebec Province, so as to assure a supply for years to come. This item in the plans of the promoters has, perhaps, not received so much attention as it should have done. It illustrates in a vivid manner the fact that American paper manufacturers have at length really begun to realize the position at which they have arrived. Of course they have been getting their supplies of wood from Canada for a long time past, but the present movement is evidence that the time has arrived for them to prepare themselves for the future in a concerted manner. As to the true status already reached by the amalgamation, and the details of the organization which is hoped to be effected, the air is full of rumors which may or may not be true. The promoters are keeping very reticent. The report that the International Paper Company was at the back of the movement is now denied, while many other names, including those of J. D. Rockefeller and J. G. Hanrahan, are mentioned in connection. The only thing that appears probably true is that the arrangements are making satisfactory progress and that the only danger of failure of the promoters' plan lies in the insufficiency of the pecuniary estimates made by the appraisers as to the value of some of the more important mills. The work of valuation is now going on.

* * *

END OF LOCK-OUT IN NORWAY.

A settlement has been effected of the dispute between the pulp and paper mills of Norway and Sweden and their employees, the lock-out having been successful. It was in actual force only about a week, and the parties who carried on negotiations are to be congratulated on their speedy success in coming to an understanding. The great majority of the workers have, it is understood, accepted the proposals submitted by the employers. The last wages tariff put forward will remain in force until April, 1908. A new scale will then be adopted, to be binding for a period of three years. The labor troubles in Norway have had a stiffening effect upon prices of wood pulp, which has made itself even in this country. In England and other European countries, of course, the effect was still more marked. One result in England has been the increased production of cellulose, which has been readily absorbed at full prices. The market for mechanical still continues very firm, and some makers are inclined to be exorbitant in their demands. Consumers, however, are not likely to see former low prices ruling. British and European paper manufacturers have seized the opportunity presented by the scarcity of pulp to put the prices for paper on a higher and more reasonable basis.

* * *

COVER-PAPER TRADE CUSTOMS.

Manufacturers of cover paper recently adopted at a meeting in Buffalo the following rules:—

1. On plain standard covers the following shall be considered "regular" sizes and weights—all others shall be considered "special": 20 x 25—25, 20 x 25—35, 20 x 25—50, 20 x 25—65, 25 x 40—50, 25 x 40—70, 25 x 40—100, 22 x 28—35, 22 x 28—50, 22 x 28—60, 22 x 28—70. On weights lighter than basis of 20 x 25—25 an additional charge shall be made of 10 cents per 100 pounds for each pound per ream below that basis. 2. On special sizes or special

weights not less than 10 per cent. additional price for lots less than one ton. 3. On special colors, or colors not regularly made in the grade ordered, ton lots or less, not less than 10 per cent. additional price. 4. On special orders for one ton or less, over-runs not greater than 15 per cent. to be taken by customers. On orders for more than one ton over-runs not greater than 10 per cent. to be taken by customers. 5. Orders for less than a full package or bundle not less than 10 per cent. additional. 6. No paper to be made one weight and stenciled another. Paper to be marked by manufacturers the ream weight ordered, and there shall be no evasion by substituting letters or symbols for figures. 7. The average actual weight, including wrappers, not to exceed 2½ per cent. above or below the nominal weight. Paper within this weight to constitute a good delivery, and to be billed at nominal weight. The above to be based on items of one size, weight and color on individual invoices. 8. No claims allowed after paper is cut or printed. 9. All goods to be billed when ready or at accepted date for shipment, and to be settled for at the usual time whether ordered shipped or not.

AUSTRALIAN TARIFF.

The enactment of an Australian tariff, including duties on paper which, it was thought would be entered free, has caused something like consternation among paper manufacturers both in this country and the United States. The fact that it comes into force without warning, and that goods which are even now on their way to Australia will be charged the full amount of duty, makes matters worse. Great Britain is granted a preference, and of course Canada ought to be granted one also, but for that, we are perhaps ourselves to blame, or rather the Dominion Government for its dilatory tactics. There is still hope that this error, which is to be deplored, both from a commercial and political point of view, will be speedily rectified. As Canada has of late given considerable attention to the cultivation of its paper trade with the Commonwealth, the matter is one which calls for more than ordinarily pressing attention. The following items in the new Australian tariff will serve to show how the trade is affected :—

	General Tariff.	British Tariff.
Printing paper for newspapers, in sizes not less than 20 by 25 inches, or its equivalent	10%	free.
Browns	6s. 6d.	6s.
Cartridge and blotting, per cwt	6s. 3d.	6s.
Straw board, per cwt.....	2s. 6d.	2s.
Bags, ad valorem	30%	25%
Other paper, including cardboard, etc.	20%	15%
Pulp, for manufacturing paper	5%	free.
Roofing, sheathing and insulating papers........	5%	free.
Writing and typing paper (plain) in sheets of not less than 16 by 13 inches	5%	free.
Tissue and cap paper in sheets 20 by 30 inches and over	5%	free.
Stationery, manufactured complete, pens, inkwells, and the like, ad valorem	30%	25%
Other manufactures of paper	30%	25%

PULP AND PAPER INDUSTRY IN THE UNITED STATES.

The United States Census Bureau has now issued, in bulletin 80, under W. M. Steuart, chief statistician of manufacturers, a very complete synopsis of the paper and wood pulp industries in that country. In 1905 the value of the products was $188,715,189, and the industry gave employment to 65,964 wage earners, the capital invested in it being $277,444,471. In 1900 the value of products was $127,326,162; the number of wage earners, 49,646; and the investment of capital, $167,507,713. In 1890 these items were as follows:—Value of products, $78,937,184; number of wage earners, 31,050; capital, $89,829,548.

The growth in the five years beween 1900 and 1905 surpassed the growth in the preceding ten years. Thus the value of products, which increased by $48,388,978 between 1890 and 1900, increased by $61,389,027 between 1900 and 1905; the capital employed, which increased by $77,678,165 in the ten year period preceding 1900, increased by $109,936,758 in the next five years. The number of wage earners, however, did not grow in quite equal proportion.

The modern tendency to concentrate industry into a smaller number of larger plants is indicated by the fact that in spite of the growth in other respects, the number of manufacturing establishments remained practically the same in 1905 as in 1900.

The total value of product in 1905 was $188,715,189, of which news represented $35,906,460; book, $37,403,500; fine paper, $22,248,170; wrapping, $30,435,592; boards, $16,959,559; tissue, $5,056,438; blotting, $1,046,790; building and roofing papers, $4,845,628; wall paper, $3,013,464. Production of news increased by $15,814,586 from 1900 to 1905, or 78¾ per cent.

The value of materials used in 1905 was $111,251,478. Of which, $27,633,164 represented the wood pulp and fibre purchased. The figures indicate a growing tendency to combine the manufacture of wood pulp and the finished product. The principal raw materials used in the paper industry are wood, usually spruce or poplar, rags (used for finer paper), old or waste paper, manila stock, jute bagging, rope, straw, sulphur, clay, etc. The most important of all these, measured by quantity and cost, is wood. In the paper and wood pulp industry, over 3,000,000 cords of wood, having a total value of over $20,000,000, were used in the year covered by the census of 1905.

◆

—One of the worst of the minor troubles of the I.C.R. would be amended by any great restriction of the exportation of pulp-wood from Canada. New Brunswick and Quebec both ship large quantities of wood across the borders, and this heavy freight is carried on cars of the Intercolonial, which then become devoted to the use of American lines, as there is generally speaking no immediate return cargo. They are in this manner sometimes lost sight of for weeks together, which is a source of considerable annoyance to the officials of the road. If the mills were on the Canadian side the I.C.R. would reap the benefit three times over, hauling the wood and other supplies to the mills, the transportation of food and other articles for the use of the community which would spring up around the mills, and the hauling away of the finished product.

PULP AND PAPER NEWS.

The Howard-Smith Paper Company, Ltd., Toronto, has been authorized to increase its capital stock from $49,000 to $95,000.

* * *

The Wood Cullers' Association of Quebec has been organized with the following officers:—President, J. B. Serin; vice-president, George Guilbeault; secretary-treasurer, J. E. Gerin-Lajoie.

* * *

Le Progres, Ltd., has received a Dominion charter to take over as a going concern the business carried on by P. Bilodeau, printer and publisher, Montreal, and to print and publish newspapers, books, etc.

* * *

The past season has been particularly favorable on the St. John River, New Brunswick, for driving logs. Generally speaking, about 35,000,000 ft. of lumber are tied up each year, but this year the full cut, estimated at 160,000,000 feet has come down in good shape.

* * *

Richardson, Bond & Wright, Ltd., Owen Sound, Ont., have been incorporated to carry on a printing, publishing, lithographing, and stationery business; capital, $40,000. J. A. Richardson, H. Wright, jr., and Alfred Bond, of Owen Sound, are among the provisional directors.

* * *

R. H. Pope's pulp limits in the township of Ditton, Auckland, Emberton, and Newport, near Cookshire, Que., have been taken over by the Pejepscot Pulp and Paper Company, of Lisbon Falls, Me., the reported price being between $200,000 and $300,000, which includes some mills.

* * *

The following item from the Vancouver World of a recent date will explain itself: "Owing to a shortage of paper the World has been forced to refuse a large quantity of advertising to-day, and regrets that the same reason has forced the exclusion of much valuable news matter from its columns."

G. B. Green, of the Upper Ottawa Improvement Company, which has charge of the drive in the Ottawa River, reports that only a small quantity of pulp-wood is left at any points along the drive. It has been a very heavy season, and there are probably over 8,000,000 pieces of timber in the river, including the lumber.

* * *

The Pentecost Lumber Company, which owns valuable limits on the north shore of the St. Lawrence, Quebec, and which ships large quantities of pulpwood to the United States, has sold out to the St. Maurice Lumber Company. Another tract of valuable pulp land in the Province of Quebec, which changed hands lately was the property of the estate of the late C. Marcoux, of Berthierville, Que., and situate in Maskinonge County. The pulp-wood will be shipped to two mills in Plattsburg, N.Y.

* * *

The Dominion Government contemplates making changes in its system of disposing of timber limits in the North-West and in the railway belt of British Columbia. In the past, the lumber companies have usually done the cruising and exploration work on their own account, and this was all right when lumber was less valuable. In the future, the Government will likely do its own cruising, and will arrange the berths in such a way as to dispose of choice tracts in connection with pieces less thickly timbered.

* * *

At the annual meeting of the Cornwall Paper Manufacturing Company, Mille Roches, Ont., the following officers were elected:—President, S. Greenwood; vice-president, R. J. Pitts; managing director, P. E. Campbell, Cornwall, Ont.; Directors, E. H. Brown and C. Deruhie, Cornwall; M. P. Davis, Ottawa, and J. A. Cameron, Dominionville, Ont.; secretary-treasurer, A. M. Wisner; manager, J. L. McNichol.

NEWS OF THE MILLS.

James A. Mullen, formerly with the Crocker-McElwain Co., Holyoke, Mass., has been appointed to a position with the Toronto Paper Co, at Cornwall, Ont.

In last number we referred to the Ottawa Pulp and Paper Company, which is establishing a factory for making paper from the refuse of pulp mills. The process will be carried on by means of the Cornell Refuse Mill. The Booth & Eddy Mills already utilize a large portion of their screenings or refuse, but several tons are still available on the Chaudiere, and these the new company will use as described.

On August 22nd, over the E. B. Eddy Company's mills in Hull, Que., and at every one of its branches and agencies throughout Canada there were flags flying in honor of its founder, the late E. B Eddy, who was born on that date 80 years ago. Mr. Eddy intended that the works should be a monument to his memory, and the present management are doing their part in keeping them up to date in every way.

The Canadian Pacific Sulphite Paper Company, who are building pulp and paper mills at Swanson Bay, B.C., and recently gave a contract for excavation and concrete work on the pulp mill to the British Columbia General Contract Co., Vancouver, has now given the contract for the power dam, pipe line and electric plant to Elliott & McCallum of the same city. The dam will furnish a head of 120 feet of water, and there will be at the beginning three Pelton waterwheels. It is expected that the plant will turn out from 25 to 40 tons of pulp per day. The mill's product of paper will be shipped largely to Japan, according to Manager McKinnon's present idea.

E. R. C. Clarkson, Toronto, has been appointed to go over the affairs of the Imperial Paper Mills, Ltd., Sturgeon Falls, Ont. Court proceedings are still going on. The Quebec Bank contends that John Craig, one of the two receivers who have been conducting the mills, is incompetent to manage that particular business, and asks for the appointment of Mr. Gray, at present acting as superintendent, to be manager. Mr. George Edwards, one of the joint receivers in the company, in an affidavit filed in reply, states that the business should be continued as a going concern, and that the debenture holders should allow the receivers the widest latitude.

The W. E. Edwards Company, Rockland, Ont., has an agent now traveling in Norway and Sweden, and other parts of Europe, investigating pulp conditions. The company is doing this in order to gain information likely to assist it in starting its proposed pulp mills in Canada. The expert states his opinion that while Canadian pulp-wood is better than that of Scandinavia, yet the product of the latter is of rather superior quality so far. In the latter point he does not altogether agree with some others well qualified to express an opinion, who believe that while in some respects the Norwegian pulp has a slightly better appearance than Canadian, yet the latter has a stronger fibre and is to that extent superior.

James Beveridge, who has been manager of the Miramichi Pulp and Paper Company, Chatham, N.B., for some years past, has severed his connection with that company, and Mark H. Spaulding, formerly general superintendent of the Riordon Paper Mills at Hawkesbury, and who has had great experience in the business has been appointed manager in his place. A paper mill is to be added to the present mills, for the manufacture of manilas and fibre papers, which will employ 100 or 150 men, in addition to the present number of 290. Mr. Beveridge, who takes with him his two sons, Donald and Brooks, contemplates building another paper mill for the manufacture of manila, either at Chatham or Nelson or Newcastle. At first it would probably be of one-machine capacity, giving employment to about 60 or 75 hands.

PHENOLS IN CELLULOSE MANUFACTURE.

It has been customary, hitherto, to use acid or alkaline solvents in the preparation of cellulose from straw, wood, etc. These raw materials, with which may be included jute and esparto, contain from 50 per cent. to 60 per cent. of cellulose. The remainder consists of resinous and gummy bodies, lignine, and mineral salts. In the treatment of jute and straw soda is generally used, but it is only rarely employed with wood, which was at first treated with solution of sodium sulphide according to Dahl's patent. This process was, however, soon superseded by the sulphite method, in which sulphide of lime or magnesia is employed. This method has grown enormously. During the last twenty-five years seventy-five factories of its applications have grown up in Germany, and produce nearly a quarter of a million tons of cellulose annually, at a price of about £10 per ton; and the sulphite process has reduced all raw materials, except wood, to a negligible value for paper-making purposes.

The method used to be confined to wood derived from trees with persistent leaves, and giving little ash or resinous matter; but the great increase in the amount of wood used for paper-making purposes has necessitated many endeavors to extend the sulphite method, itself the cause of the increase, to other sorts of wood, pine-wood especially. Now solutions of bisulphite of lime dissolve the lignine and the inorganic salts of these woods very well, but not the rosins. This is unfortunate, as the heart-wood of the pine is often very full of rosins—not to speak of the twigs and fruits. The natural result of this knowledge was attempts to redeem the rosin-content of the raw material before subjecting it to the sulphite treatment. Many rosin-solvents—such as benzole, light petroleum oils, etc.—were tried, but without success, partly because these liquids contaminated the rivers, being discharged into them with the general waste-water from the factories, partly because they gave off vapours injurious to the health of the workpeople, and partly because there were certain practical difficulties in their use. According to German Patent 94,467, the heavy—i.e., phenol-containing—coal-tar oils dissolve all foreign bodies away from the cellulose at about 300 deg. F., and neither waste nor injure the cellulose, nor create any kind of nuisance after use.

It was found that coal-tar had no action on wood in the cold, but that on heating it left behind a fibrous mass consisting of almost completely pure cellulose. Pure benzole is useless, as it dissolves rosins only. The same may be said of the light oils. Napthalene makes the wood harder and stronger and less elastic, but dissolves out nothing; while paraffins, when hot enough, to dissolve anything, decompose the woody fibre, forming acetic acid, wood spirit, and charcoal.

Phenols avoid all these difficulties. Phenol itself, as well as the cresols, xylenols, and some of their ethers, such as guiacol, have the proper solvent action without any drawback. The mode of action of the phenols is not yet understood, but their practical value for these purposes is incontestable. It is, of course, obvious that to get perfectly white cellulose a colourless phenol must be used to carry out the freeing of the cellulose from the other ingredients, otherwise the solution will be of a more or less dark brown colour. In any case, the dissolving action is promoted by heating under pressure, usually for from four to five hours at about 350 deg. F., and the phenols used should not contain more than about 40 per cent. of impurities, or the boiling will, of necessity, be too prolonged. The more rapidly the foreign bodies are removed from the cellulose the better the result will be. The metal in which the boiling is done is not a matter of indifference, as metals are very differently attacked. A pan of iron, if not frequently cleaned and polished, will soon give a perfectly black cellulose. A pan having 120 square yards of heating surface will lose in 6,000 hours of work 9 lbs. in weight if of copper, 42 lbs. if of lead, and 131 lbs. if of iron.

The solution of straw and of most kinds of small stems is rapid, being complete in about five hours. Good wood takes from six to eight hours, dense resinous wood from ten to twelve hours. The branches give quite as good cellulose as the trunk, except that the staple is somewhat shorter.

Phenols guard the cellulose extremely well against the destructive influence of heat. While a temperature of from 350 to 400 deg. F., decomposes it rapidly while it is in the air or water, it will stand forty-eight hours or more of such a temperature in a phenol without any appreciable change. Pressure favours the action of liquid phenols, and if only their vapors are used a clear excess of pressure of at least two atmospheres is necessary to give the proper temperature. The low specific heats and latent heats of evaporation of the phenols are advantages not to be despised. During the boiling there is a certain amount of loss of the higher boiling fractions, but this unavoidable waste leaves the solvent better than at first, and greatly assists the solution of the lignine. When the boiling is over the residual cellulose is soaked with solution of lignine, etc. This is removed, first by hydraulic pressure, and then by rinsing with more of the original solvent.

The phenol method gives nearly the theoretical yield of cellulose. The phenols are distilled after use, the distillate serving again, and the residue left in the stills being an excellent fuel of high calorific value. The still should be provided with a good reflux condenser to save the more volatile bodies generally contained by the phenol in use. The cellulose obtained can be used for any purpose, such as paper-making, guncotton, or collodion manufacture, and can easily be dyed. The only drawback of the phenol pulp is that it has hitherto proved to be impossible to make perfectly white paper from it, although the pulp got with a pure phenol is quite light enough to be dyed even very pale shades. —Paper and Pulp.

* * *

UNSETTLED CONDITIONS IN FINLAND.

A strike has broken out at Kangas Pappersbruk, Jyvaskyla, the workers demanding an eight-hour day with the same wages as at present. The company is in liquidation. The men, however, have gone out on strike. In Finland at the commencement of 1906, there were nineteen paper mills, thirty-one mechanical wood pulp mills, of which twelve supplied only the paper mills to which they belonged, and ten sulphite pulp mills, of which four were independent and six were combined with paper mills. Since then seven new paper mills and a large number of sulphite and wood pulp mills have been started. The production of mechanical wood pulp for 1907 is estimated at 32,000 tons, and wood pulp boards 44,000 tons. The four independent sulphite mills, together with those newly erected, are expected to produce 40,000 tons, or double the quantity turned out last year. Last year there was a good deal of talk about strikes in Finland, but only about 4 per cent. of the paper mill workers have been affected. The largest mill in Finland has promised its workers that three shifts of eight hours each will be introduced, instead of the hitherto prevailing two shifts of twelve hours each.

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The Finnish Publishing Company, Ltd., Port Arthur, Ont., has been incorporated to carry on business as printers, publishers, etc. S. Alanne, J. Rinne, and others, of Fort William, are provisional directors.

RECOVERY OF TURPENTINE, ETC., FROM WOOD.

F. P. Veitch, chief of the paper laboratory of the Washington Government, in a report on chemical methods for utilizing woods, states that each year there are millions of cords of wood wasted in the forest and on the farm. This wood, because of its shape, size or quality, is not suitable for the numerous mechanical uses for which wood is employed, and information regarding other means of disposing of this waste is of general interest. Aside from paper-making and tanning, which are chemical industries that have been established for hundreds of years, there are other industrial uses, of more recent origin, which are of agricultural importance because they offer a means of utilizing these wastes of the sawmill and the forest. The more important of these are destructive distillation, recovery of paper pulp, etc.

After describing various distillation methods he goes on to say that in addition to these resinous woods may be treated by other processes for the recovery of the turpentine and rosin which they contain. For various reasons these processes have received but little attention in the past. Their successful operation requires more chemical and technical knowledge and a more extensive plant than the methods commonly employed in recovering turpentine and rosin. Heretofore the value of the products, some of which were not utilized, did not justify the greater cost of these processes. However, as a good grade of light wood contains from fifteen to thirty per cent. of rosin and turpentine which may be recovered by chemical treatment, and as the extracted wood is suitable for paper-making, present prices justify a brief consideration of these processes.

When woods are treated with boiling alkali solutions, with or without pressure, turpentine is volatilized, and rosin is dissolved together with other noncellulose matter. The turpentine distills off and the dissolved matter may be subsequently washed out and recovered as a soap in which form it may be used as sizing material for paper and in making soap, or the alkali resinate may be thrown out of solution by neutralization and recovered as an impure rosin. In either case the rosin or resinate may be destructively distilled, if desired, for the preparation of rosin spirits and rosin oils. By burning the residue in the retort in a current of air, black ash—an impure alkali carbonate—is recovered, which may be used again for the extraction of turpentine and rosin. Rosin and turpentine may be recovered in the manufacture of paper pulp from pine wood by this treatment.

It has been proposed to recover turpentine and rosin by extracting the finely chipped wood with a volatile solvent, such as benzine, alcohol, etc. In this case the rosin and turpentine obtained are of exceptional purity; but the practibility of recovering the solvent economically remains to be demonstrated. This process also involves considerable risk from fire.

Both processes are particularly suited to the treatment of sawdust and other finely prepared waste wood, which are destructively distilled only with great difficulty. Both of these methods for the recovery of turpentine and rosin are now being investigated in this laboratory for the purpose of determining their value as industrial processes. As far as known, turpentine and rosin are not recovered with volatile solvents in actual practice.

The annual waste (in lumber saw mills), which is now sold for fuel in the United States, is, according to the Forest Service, equivalent to approximately 4,000,000 cords of wood, or within 800,000 cords of the amount now used in the destructive distillation (1,145,000 cords) and paper-making (3,647,000 cords) industries. If to this be added the waste, such as tops, lap and dead and down timber left in the woods, this quantity is more than doubled, although no definite figures as to the total quantity can be given. The mill and forest wastes from resinous woods would yield a larger portion of the turpentine and rosin now produced and several times as much soda pulp as is now made. The waste from the hardwood lumber industry would yield more charcoal, wood alcohol and acetate of lime than is now being produced. The sawdust from the Southern pine mills alone will yield more oxalic acid than is now used in this country. The spruce and hemlock waste will yield at least one half of the sulphite pulp now produced. The question is, can these industries be most profitably conducted in conjunction with the lumber industry or independently? While, perhaps, a categorical answer applicable to all conditions cannot be given at present to this question, the above-mentioned facts strongly indicate that the proper industrial location of the chemical industries using wood as a raw material is in conjunction or close affiliation with the lumber industry. Such combination means cheap raw material and fuel for these industries and increased profits for the lumber industry, as well as the removal of waste, which otherwise seriously interferes with the use of the land and is a constant menace from fire.

The gross values obtained per cord of wood are lowest when the wood is subjected to steam or destructive distillation, and it is advisable, therefore, that attention be directed more to those methods of utilization which give larger gross values. Thus the recovery of turpentine and rosin by extracting with soda or volatile solvents and using the residue for paper pulp or for making oxalic acid are promising methods of utilizing pine wood that are receiving some attention from paper-makers and investors, and their industrial value should be carefully determined.

HALF-BLEACHED SULPHITE PULP.

The idea that half-bleached pulp could be replaced by a mixture of unbleached and completely bleached pulp has not proved to be a good one when submitted to the test of practice. Cases have been known where customers have refused to accept large quantities of paper which had been made from that mixture, they not knowing what process had been used. The reason is not far to seek. A half-bleached pulp—i.e., one treated with a small quantity only of chlorine—is much cleaner than the mixture, for the raw unbleached pulp always contains a lot of brown colouring matter which gives the paper a dirty look, as well as colour. The old method of half-bleach, three-quarter bleach, etc., according to the sample to be matched, cannot be displaced by any crude method of this nature.—Paper and Pulp.

PULP INDUSTRY IN GERMANY.

Several conventions of those interested in the paper industry have been held during the last few weeks in Germany.

One speaker called attention to the fact that in spite of the absence from the German market of northern competition, as well as the increased cost of raw material and of labour, no important advance in prices had been established, though the demand was brisk. Another member gave an estimate of the cost of production of wood pulp per 100 kilos. Reduced to American equivalents per 100 pounds it would be: Wood, 60 cents; coal, 38 cents; and wages, 11 cents; total, per 100 pounds, 1.09 dollars. As this calculation makes no provision for interest, depreciation, management, etc., it was urged by the speaker that it was impossible to produce air-dry steam ground wood under the equivalent of 1.15 dollars per 100 pounds. Stocks were reported to be low, and the general tenor of the remarks made was that pulp manufacturers should have more confidence in themselves, and show paper manufacturers that they are dependent on the pulp mills. A resolution calling for a revision of present prices was unanimously agreed to.—World's Paper Trade Review.

DEVELOPMENT OF THE WOOD PULP, CELLULOSE, PASTEBOARD AND PAPER-MAKING INDUSTRIES OF NORWAY.

The recent serious strike in the Norwegian pulp mills has attracted special attention to Norway as a pulp producing country. The following history, therefore of the beginning and growth of the industry there, contributed to the Wood Pulp Maker by O. Tobiesen, C.E., will be of interest:—

During the year 1869 Norway made and exported 60 tons of mechanical wood pulp, and in 1870 500 tons. This was the beginning of an industry which, together with the making of cellulose and paper, has, during the last quarter of a century, been developed at such an amazing rate that it now over-reaches the value of fish and fish industries, which had hitherto been the most important export commodities from Norway.

The value of the exports of wood pulp, cellulose, pasteboard, and paper during 1906 was over 50,000,000 kroner. For raw material the forest owners alone have received about 20,000,000 kroner in payment. The different works have together employed about 9,000 workmen; or, if we take an average of four persons per family, about 36,000 persons have obtained their livelihood from these industries. These figures do not include wood-cutters who indirectly have to do with the manufacture of paper. In wages to the workmen there has been paid a sum of about 7,500,000 kroner. There were, according to the statistical reports, in the year 1903, sixty wood pulp, eighteen cellulose, and eight paper mills; but during the last three years new factories have been erected and old ones extended, and in 1905 and 1906 ten new paper mills have been built.

The advantages derived indirectly from these industries have spread to nearly all commercial enterprises. For instance, to transport about 600,000 tons from the country to the consumers in England and elsewhere, the shipping companies have earned an income of about 6,000,000 kroner, and in the making and drying of manufactured paper about 300,000 tons of coal is required, besides china clay, sulphur, and other chemicals, on all of which, of course, freight has to be paid to the carriers, not only over-seas, but also on our railways.

It is gratifying to see that we have been able to take advantage of the great natural conditions existing in the country in the development of this industry. For instance, the powerful waterfalls which have easily been made wonderfully useful, and the raw material from our forests which has been readily available owing to easy and good natural communications, and which were, of course, absolutely essential.

Our oldest factories are therefore situate near the Drammen and Randsfjord Railways, which is one of our earliest railways, and was finished in 1868; but at no very distant date it is anticipated that new factories will be built near the Christiania Fjord, or other convenient shipping places, and that electricity, which would be generated at the waterfalls, would be led to them.

Further, all machinery necessary in the manufacture of wood pulp is of Norwegian make; and the boilers and all other machines requisite in the making of cellulose (except the drying apparatus where the pulp is made into boards and dried) are also of home manufacture. The machinery, however, that is necessary in the paper-making branch of this industry is all obtained from foreign countries. On this subject clever business men are carefully considering whether it will not be possible to manufacture our own machinery in the country, and concerning this I shall have more to say when I come to the part of these articles which deals with the paper-making branch of the trade.

Nor can we be blamed with tardiness in taking up and developing this wood pulp industry, for we were fully five years in the market before the Swedes. But they made up for that by their pushfulness in the manufacture of cellulose.

It can be readily understood that this industry represents a very considerable capital value, but exactly how much it is very difficult to ascertain, and I know of no means of finding out. However, one may calculate that every well situated and managed paper, cellulose, or wood pulp mill ought to turn its capital over once in a year, and starting with this hypothesis, it is not difficult to arrive at approximately correct figures. But it is fairly certain that many, especially the old factories, do not turn over more than 75 per cent. of their capital per annum, and, as previously stated, that the export value of the wood pulp, cellulose, and paper is over 50,000,000 kroner per annum, it will be fairly correct, and sufficient for all practical purposes, to estimate the amount of locked-up capital as being about 75,000,000 kroner.

Of the ninety-five mills the State registers noted as existing in 1903, there were only three foreign-controlled companies, namely:—

(1) The Kellner-Partington Company, Ltd., with three factories—one wood pulp and two cellulose and paper mills (Borregaard); (2) Edward Lloyd, Ltd., with one wood pulp mill (Honefos) and Vittinfos wood pulp and paper mill; (3) the Bohnsdalens Mills, Ltd., with two cellulose, one wood pulp, and one paper mill

The remaining eighty-four factories are probably owned entirely by Norwegians, worked under Norwegian management, and with Norwegian capital.

The wood pulp industry cuts deeply into our forests every year. Many years ago it was foretold that in a short time our woods would exist only as a remembrance; but, nevertheless, owing to the building of new factories and the extension of old ones, the consumption has steadily increased. The demand grew bigger from year to year, and, as a consequence, prices have steadily risen. It will therefore probably be of interest to try to ascertain what quantities of timber our forests can produce, and compare the result with what is being consumed yearly, so as to be able to form an opinion as to what quantities will be available when our new large cellulose mills are in full work without too severely depleting our resources.

To produce one ton of mechanical wood pulp, containing 50 per cent. of moisture, a dozen pieces of timber (12 yards long by 6 ins. top diameter) are required, or about two cubic metres of wood. Since 1870 the price for this quantity of wood has risen from kr. 9 to kr. 15, delivered at the factories. For a ton of dry cellulose or paper about 4 cubic metres of wood are required.

The Forest Commission of 1874 endeavoured to ascertain what our forests yielded and to what extent their productiveness was taxed per annum. There is taken from the land 467,000,000 cubic feet of wood, which equals about 14,000,000 cubic metres, per annum.

Now if we reckon on 1 acre being able to produce every year a growth of 5 cub. ft., the total area of forest land, about 501,714 sq. Norwegian miles, which equals 63.7 millions sq. km., will produce a yearly growth amounting to 325,110,500 cub. ft., or a difference of 116,684,500 cub. ft. Thus we are drawing from our capital a quantity of about 116,500,000 of cub. ft. more than the whole of our forests can produce per annum; 349,000,000 cub. ft. are required for home use, and consequently there remains for export not more than 74,000,000 cub. ft., a little over one-fourth. This speaks clearly of great waste and bad management in the employment of timber for fencing, firing, and building wood in the towns and in the country.

Now let us go a generation forward and look into the position of affairs in

1904, which was a most unfortunate year for the export of timber. There was then exported in—

Planed wood (about) 570,000 cubic metres; sawn (about) 600,000 cubic metres; hewn and round (about) 630,000 cubic metres; totalling, 1,300,000. Against 2,200,000 cubic metres exported in the year 1874, to which must be added the quantity of wood used by the wood pulp and cellulose factories, 1,960,000; totalling, 3,760,000.

From the above figures we see that exports of timber have been nearly doubled and consequently home requirements must have been very materially reduced. This was probably effected in the country in the use of wood for fencing-in of properties and in towns for firing purposes.

It is satisfactory to contemplate the fact that notwithstanding the increased demand for timber, we are still able to supply the raw material needed for the wood pulp factories—although certainly at higher prices—without our forests being unduly overtaxed.

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EFFECT OF MOISTURE ON WOOD.

The United States Foreign Service has issued a pamphlet on "The Strength of Wood as Influenced by Moisture," in which it shows the strength of woods in all the degrees of moisture from the green state to absolute dryness, and the effects of resoaking.

The effect of water in softening organic tissue, as in wetting a piece of paper or a sponge, is well known, and so is the stiffening effect of drying. The same law applies to wood. By different methods of seasoning two pieces of the same stick may be given very different degrees of strength. Wood in its green state contains moisture in the pores of the cells, like honey in a comb, and also in the substance of the cell walls. As seasoning begins, the moisture in the pores is first evaporated. This lessens the weight of the wood, but does not affect its strength. It is not until the moisture in the substance of the cell walls is drawn upon that the strength of the wood begins to increase. Scientifically this point is known as the "fibre saturation point." From this condition to that of absolute dryness the gain in the strength of wood is somewhat remarkable. In the case of spruce the strength is multiplied four times; indeed, spruce, in small sizes, thoroughly dried in an oven, is as strong, weight for weight, as steel. Even after the re-absorption of moisture, when the wood is again exposed to the air the strength of the sticks is still from 50 to 150 per cent. greater than when it was green. When, in drying, the fibre saturation point is passed, the strength of wood increases as drying progresses, in accordance with a definite law, and this law can be used to calculate from the strength of a stick of one degree of moisture what its strength will be at any other degree.

Manufacturers, engineers and builders need to know not only the strength but the weakness of the materials they use, and for this reason they are quite as much interested in knowing how timbers are affected by moisture as they are in knowing how they are weakened by knots, checks, cross grain, and other defects. It is obvious that where timbers are certain to be weakened by excessive moisture they will have to be used in larger sizes, for safety. So far, engineers of timber tests, while showing that small pieces gained greatly in strength, do not advise counting on the same result in the seasoning of large timbers, owing to the fact that the large timbers usually found in the market have defects which are sure to counterbalance the gain from seasoning.

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—It is interesting to note that in Norway, according to the report of a recent commission, water power in seven large plants examined, cost $31.36 per horsepower. Scarcity of labor is a troublesome factor in that country as it is here.

SOME ORIGINAL IDEAS ON WOOD YARN.

The time is here when dignified Augusta, Me., or graceful Richmond, Va., or energetic Elizabeth, N.J., or breezy Denver, Col., may sweep aside the paper portieres in her dressing room, attire herself in her paper skirt and invisible paper shirt waist, don her paper hat, and, taking along all the paper money she happens to have handy, go downtown and buy a few more dozen of the new paper napkins that go so well with the new paper tablecloths.

For the age is at last ready to become an age of paper, all the way from the paper string that ties up the package of paper napkins to the paper sheets between which Augusta in Maine; Adelaide, out in Australia; Washington, Lincoln, or Franklin, almost anywhere in the United States, can sleep for the paper covered future.

Fanciful Frank Stockton, a generation ago, made his escape from the famous lady and the tiger—the success which rendered it nearly impossible for him to sell what he wrote immediately afterward—by telling the story of the penurious pinmaker who slept under a blanket of newspapers—not because the newspapers of the day put you to sleep, but because newspapers at night were warmer than woolen blankets.

It was a story that was all the more amusing for being so true, and not the least truthful of its features was the declaration that a newspaper is one of the warmest things—quite apart from the big type and colored scare heads of to-day—that humanity can put itself next to.

Street car conductors, on cold and slushy days, often risk a quarrel at the car barn or a suspension by the superintendent by laying a thickness of newspaper on the rear platform. Any numbers of workers exposed to long hours of cold find a newspaper between coat and vest a better protection than a chamois or woolen chest protector—as warm, in fact, as a rubber coat, without inducing the weakening perspiration of caoutchouc.

Perhaps Stockton's story inspired the ever inventive Germans to try their hands at obtaining practical results; perhaps it didn't. But the results are here, anyway.

Process after process, patent after patent, have conspired to make paper—common, ordinary paper—available for yarn. The strange thing about the outcome of twenty years of experiment is that the material made of paper loses all its heating properties, and, in the last analysis, adapts itself best to articles of apparel in which warmth is not to be desired.

The manufacture is not very intricate. Rags, wood—almost anything that will make good paper—are ground up into a pulp. The pulp, drawn off on wirecloth drums, forms narrow bands of paper, which are partly dried and then spun into yarn. The yarn can be beautifully dyed, and treatment with chemicals gives it strength, elasticity, and glistening smoothness.

One variety of the paper yarn is being used for the making of girdles, suspenders, edging and similar materials. Another makes tablecloths, towels, buckram linings, sacking, hangings, upholstery goods, and even rugs. It comes into service as an ally of its predestined enemy—cotton—for it is cotton that will be most affected, and most helped, by the new article of commerce.

Wood pulp costs only one-third as much as cotton, and excellent rugs and portieres are woven with the warp of cotton and the woof of the paper yarn. So it is likely to cut down the sale of cotton to an appreciable degree, although the world is growing bigger every day. Southern planters need not begin hunting mortgage money for a long time yet. The probability is that they will welcome the new material eagerly, for it is now conceded to solve the already desperate problem of jute bagging for the increasing cotton crop. It is amply strong enough, and it lasts as long as jute ever dares last. Not only has cord made of the paper been used extensively for tying up packages, but sacks made of woven paper have been found to give good service as mail sacks.

Fish gelatin has lent to the fabrics made of paper a property which constitutes the final test of practical utility —resistance to moisture. They are wearable, pliable, washable, dryable—perhaps boilable and fryable, for all anybody knows to the contrary. Soaked in water for a day and a night and then allowed to dry, they prove to be as strong as ever, and the only difference detected is a slight shrinkage. There is no doubt that they would stand frequent exposure to rain as well as, and possibly better than, many cloths and muslins now in general use at much higher prices.

With the loss of the heat retaining properties that characterize the ordinary sheet of paper, the new cloth becomes even cooler than cotton for wear as a garment. But that is an immensely valuable asset, for it makes the stuff peculiarly suited to all warm climates and to the torrid summer season of many so-called temperate zones.

A boon thrice blessed it can be to thousands of summer workers, as well as idlers, men as well as women, whom it will enable to comply with the proprieties and still be as comfortable as though they were discarding half the clothing which the conventions compel them to wear.

Its utilities cover the needs of humanity from foot to head, for already straw hats are made of paper more cheaply and more handsomely than the original straw aspired to. The paper " straw " hats do not fade and do not wilt, and the material being of any length, miracles of all sorts in hat making are awaiting the deft hands of the designer. The most impressive triumph thus far achieved has been the attainment of quality in paper " straw " which challenges comparison with the finest Panama hats.

So the paper age has arrived. The German way has taken twenty years. American way won't be satisfied if it takes longer than twenty minutes.

What with our hurry-up habit of discovering a forest and jamming a pulp mill into its peaceful insides, the future seems to hold out the promise that the modern Adam and Eve will soon be able to promenade into the dreamy woodland in the morning and come out with a couple of trunkfuls of stylish fig leaves in the afternoon. Which is getting back to Nature with a vengeance.—Paper Trade Journal.

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—The first annual convention of the Booksellers' and Stationers' Association of Ontario took place in Toronto two weeks ago. T. Hay, of St. Thomas, Ont., read a very interesting paper dealing with the necessity for closer investigation into the cost of selling goods. The election of officers resulted as follows: President, William Tyrrell; vice-president, J. G. Cloke; secretary-treasurer, W. A. Craik; executive committee, E. S. Brown, W. B. Hart, R. A. Robertson, A. H. Stratton, G. W. Sulman.

—W. B. Carmichael, of the International Paper Company, Sydney, New South Wales, states that the United States and Canada are losing ground somewhat in Australia because of the activity of the Norwegians, who are producing cheaper grades, but of an inferior quality. The establishment six months ago of a steamship line from Scandinavia direct to Australia, also has had an appreciable effect on trade conditions. Mr. Carmichael is of the opinion that when Australia realizes that the cheapness of the Norwegians' offers is dear in the long run, a mighty reaction will follow to the favor of the American and Canadian manufacturers.

MINERAL SIZING.

It is quite difficult exactly to define what is meant when it is said of a paper, that it is perfectly sized. It is, indeed, of no use to try to get an accurate rule for this purpose. On the contrary, the uncertainty of the definition has a very important practical meaning. This is well worth some consideration, and I want to point it out, moved hereby only by practical reasons.

With the degree of sizing of a paper is usually meant, how the paper behaves against writing ink, and it can consequently be called ink resistance. In this meaning the degree of sizing covers a certain limit of the general resistance against the penetration of fluids. In the practical life, however, this high resistance against fluids is never used exclusively; this is not even asked for, as, for instance, in printing papers, where the experience has taught that ink-proof papers do not belong to the papers most suitable for printing.

On account of this it has been found practical to agree upon several degrees of sizing, which are mentioned as ¼, ½, ¾, though the quantity of size is not the only factor which determines the result. It can happen that a paper with half the quantity of size is better sized than another with the whole quantity. The degree of sizing for years has meant the resistance against liquids **generally.**

At present, when paper is used for so many different purposes, liquids of the most different kind are brought in contact with it, and many of them should not, or only partly, be allowed to enter into the paper. Consequently, the demands for resistance against liquids have been multiplied. Coated and coloured papers, wall papers, light printing papers, photographic papers, must all have a high grade of resistance against the liquids used in their special treatment. Here it is not only a question of complicated salt solutions of mostly not neutral reaction, but sometimes mineral acids, which, though diluted, still attack the fibres. Nobody could expect that the resistance against all these liquids could be compared with the resistance against ink.

A preliminary test will probably always be made with ink, mainly because it is so easily executed, as everybody has this fluid at hand. It is true that there are big differences between ink and ink, as far as its penetrating qualities, and, besides, ink does not keep in the air, without alterations. Ink is also nearly exclusively used as a testing agent in estimating low sizings, and in the same way, using a pen, as with writing papers; though it is only possible to find out great differences in this way. In the following will be shown that also finer differences in the sizing can be ascertained with ink, and, also, how such a test is to be executed.

Dr. P. Klemm contends that it is quite wrong to use this test to get an opinion of papers, which, when used, never will be exposed to any liquids, and also to judge the degree of sizing from the behaviour against ink. So, for instance, with printing papers where only printing inks, that is, oily liquids, can come in consideration. It could not be supposed, and was from the beginning improbable, that oily and watery liquids should act in about the same way, so that it could be possible to judge the resistance against oily liquids from that against watery liquids.

Special experiments have been carried on to ascertain the penetrating power of oily liquids in paper, and especially of printing varnish, and they have left no doubt that the absorbing capacity for oils is not, or at least, very little, lessened on account of the rosin sizing, as compared with the absorbing capacity for watery liquids.

The experiments have shown that the most important factor is the density of the paper. Any special material for the lessening of the absorption of oils is hardly necessary. This depends upon the fact that the pulp is rapidly and completely soaked by watery liquids, but only slowly and with difficulty by oily iquids, which, for instance, can be seen in the high resisting powers of parchment paper against oils and fats.

On the other side, the rosin, used to hinder watery liquids in penetrating into the paper, is not at all the right material to hinder the oily liquids, as rosin is easily rotted by oils and to a certain extent dissolved. A very simple experiment is enough to show this fact. A drop of water put on powdered rosin is left as a pearl on it, while a drop of oil put on the rosin powder is at once sucked up. Consequently rosin is not the right material to heighten the resistance against printing varnishes.

The same can also be said about the resistance against sealing wax. The possibility of using ink is no certain indication for this purpose. Papers of poor quality can yet have a good resistance against sealing wax. Oil tracing papers, made from good materials, on the other hand, have a high resistance against ink, but are easily penetrated by oils.

The sizing cannot have for purpose, in usual printing papers, to make it resisting against the penetrating of watery fluids. The degree of such resistance obtained in sized printing papers is only of secondary importance.

It is a well-known fact that unsized papers are most suitable for printing purposes, and such papers of the best kind (for instance, for etchings on copper) are generally not sized.

For printing papers of medium or lower qualities the work of the rosin size corresponds mainly to the work of a paste, to glue certain ingredients together, for the filling substances and for the colours. The rosin size is therefore acting as a glue, in the meaning of a connecting agent, in the sizing of printing papers.

This being the case, the following question seems natural enough: Is it absolutely necessary to use rosin as size for printing papers? Are there not also perhaps other materials which could be used for the same purpose? This question is now, when the price of rosin is steadily rising, of a quite special interest. If there were materials which could be substituted for rosin, and also were cheaper, so could this be of a great importance for printing paper mills.

Experiments made in this direction justify the hope that the use of rosin is not necessary for many printing papers. Papers without wood pulp would then also have the secondary advantage, that they would not become yellow with time, which usually depends upon the presence of rosin.

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CANADIAN NEWS PAPER IN AUSTRALIA.

D. H. Ross, Canadian trade agent in Melbourne, says in a report to the Department that the consumption of news paper in Australia is increasing from year to year, and it is satisfactory to say that the demand for Canadian paper is becoming extensive throughout these States. It is estimated that approximately the Commonwealth will this year import 60,000 tons of news paper, of which 50,000 tons are required on reels and about 10,000 tons in flat. Paper mills in the Dominion are devoting more attention than heretofore to this trade, and it is not improbable that at least one-third of the 1907 Australian imports of "news" will be obtained from Canadian sources of supply.

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—If the proposed great Canadian Ship Canal from Georgian Bay become an accomplished fact..and it seems not unlikely that the requisite financial arrangements can be made in England—it should give a great impetus to the pulp-wood and other trades. It will enable ocean-going steamships to transport freight from Central Canada direct to British ports.

TWO NEW YORK VIEWS ON THE OUTLOOK FOR PAPER

The Wall Street Journal speaking of the present outlook for the paper trade in the United States, states the opinion that it is not the most encouraging possible. That conditions are unsatisfactory is due to no fault of the manufacturers, who obviously cannot regulate the elements upon which they rely for the transportation of the pulp-wood to the mills and its making into the finished article. The present season has been a hard one on the plants which rely on water power to drive their machinery. The streams have been very low, owing to the continued drought, and where steam power could not be used in times of low water the mills had to be shut down, with a consequent loss of output. The low water has also prevented the free floating of pulp-wood to the grinding mills. This, combined with an unfavourable cutting season, will make wood pulp probably scarcer than it is to-day, and increased prices for pulp will ultimately be the result. A general raise in prices of nearly all grades of paper can be looked for as a result of the unfavourable manufacturing conditions. Manufacturers are complaining that the present ruling prices are too low when the high cost of making up the goods is taken into consideration. The Canadian timber limits are being looked up extensively by American manufacturers, as suitable wood for pulp making purposes in this country is a scarce article and becoming scarcer every day. Some of the mills are contemplating taking up Canadian tracts, but they will probably have to grind their pulp in Canada, as there is a good deal of opposition developing there to the exportation of pulp-wood, and there will undoubtedly be some concerted action taken by paper men in Canada to prevent the exportation of pulp-wood to this country for the benefit of American manufacturers who are in sharp competition with them. The New York Commercial, referring to the agitation in Canada for restricting the exports
pulp-wood, takes a very conservativ
stand respecting the proposed legis
lation. As a matter of fac
it says, we have in the past denuded ou
American spruce lands very recklessly
but we are many, many years from any
thing like an exhaustion of the supply
pulp-woods, and to talk of our pape
manufacturers being "dependent"
Canada for their raw material is folly
There is at present no export duty
pulp-wood coming into this country fro
Canada, and our manufacturers of whi
paper—chiefly of the "news" variety—
are thus enabled to buy spruce logs
Canada at Canadian prices and to l
these down at their mills almost
cheaply as the Canadian paper manufa
turers can, the only difference being th
in the freights paid by the two class
of mill men on either side of "the line"
but they are doing this only so far as
is practicable, and the arrangement a
pears to be an advantageous one to bot
countries; it is certainly far better f
the United States as a whole that thes
imported spruce logs should be turne
into paper here than in Canada, and th
owners of Canadian lands surely g
better prices for their logs than if the
were no American demand. Indeed,
is the paper makers of the Dominic
who are among the foremost in a desi
to prevent exports of pulp-wood; the
figure it out that, if the United Stat
demand were to be cut off, they cou
buy their logs at considerably low
prices than now, and thus be in a pos
tion to more successfully compete wi
us in the foreign markets. If the ti
were ever to come when the Americ
consumers would be dependent on
mills of Canada for their paper,
"goes without saying" that the own
of the latter would combine and ra
prices, and we on this side of "the lin
would have to pay whatever they d
manded for their product. But Canad
as a whole would be no better off th
now.

FFECT OF FILLING SUBSTANCES.

Professor W. Herzberg contends in a ecent number of Papier-Zeitung that a lled paper is just as durable as an un- lled sheet, providing that they corre- pond in other respects, such as tension, esistance to folding, etc.

When, in 1886, the first German regu- ations were issued for testing paper in- ended for Government use, restrictions ere placed upon the proportion of fill- ig substances which such paper would e allowed to contain. The assumption as that these substances affect the urability of paper. In 1894, however, hese restrictions were abolished, and erman manufacturers have since been ree to use mineral or other filling sub- tances in paper supplied for official urposes. The opinion is sometimes ex- ressed that filling substances in them- elves affect the durability of paper, but he professor thinks it is difficult to give ny practical reasons for such a state- nent. Why should a filled paper be ess durable than an unfilled quality, if hey correspond in all other respects, uch as tension, resistance to folding, earing, etc.?

The life of a paper depends, in the irst place, on the manner in which it is sed, and, secondly, upon its intrinsic ualities. If exposed, for instance, to owerful mechanical influences, it may, nder some circumstances, be very soon lestroyed, even if composed of high rade material. An instance of this is fforded by bank notes, made with the reatest care from the best substances. f carefully preserved and handled they might last thousands of years, while, wing to various mechanical causes, in- idental to their handling, their life is elatively short.

On the other hand, papers made of quite inferior materials can survive a ong time, if protected from unfavourable external influences. Although thousands of years old, papyrus rolls, of material and quality not up to modern requirements, are sometimes found in a good state of preservation, owing to not having been exposed to air, light, and damp. A book on paper-making, by J. C. Schaffer, published at Ratisbon in 1765, was accompanied by samples of paper partly made with small proportions of rags and partly without any at all. These types (made from various kinds of wood, plants, moss, etc.) are well preserved in the two copies now in the possession of the Material Testing Bureau at Gross-Lichterfelde. Professor Herzberg remarks that they cannot have been notably different when made, and if carefully kept will last for centuries to come. Newspapers which are placed in soldered tin boxes, within foundation stones, will probably last with little change during long periods, notwithstanding their low degree of strength, the inferior quality of the fibres composing them, and the large quantity of filling substances they usually contain.

Under similar external conditions and requirements those papers should prove the most durable which are composed of substances possessing the highest chemical properties of resistance, and which are of the strongest quality. The filling substances employed by the paper industry are far superior to the purest vegetable fibres (used in the best grades of paper) with regard to undergoing changes in consequence of atmospheric and other chemical influences. If the paper is up to the mark as to strength, there would seem no reason for the presence of filling substances affecting its durability. The limited use of the latter gives the paper, moreover, a better appearance, and makes it easier to write upon.

In conclusion, Professor Herzberg remarks that if, with the addition of even a relatively large admixture of mineral substances, a manufacturer can produce a paper fulfilling official requirements, he would be making progress and not (as is sometimes maintained) going back. Of two samples equal in other respects, one filled and the other unfilled, the former may be considered as of the higher quality, its production being only possible through the use of superior raw materials and improved processes of manufacture.

PAPER TECHNOLOGY.*

R. W. Sindall, the author of the book under notice is well known, not only in England, but in Canada and the United States as an expert in all branches of the science of paper-making. He is consulting chemist to the wood pulp and paper trades, and has delivered many important lectures before English councils particularly interested in the paper industry, as well as before representatives of the printing and stationery trades. He also (in 1905) acted as technical adviser to the Government of India.

The present work is mainly a reprint in book form of the courses of lectures on "The Manufacture and Uses of Paper," delivered to students in 1905-6, at Exeter Hall, London, England. Its object, however, while it is hoped to be of service to the paper-maker, is calculated rather to give full information on this industry to those who are consumers of this important product. The writer has not endeavoured to give full details of the many important details which enter into the technical side of its manufacture. A feature, however, which will prove of marked value to everybody in any way interested is a glossary of the various qualities of paper known to the trade, and to describe as far as possibl the origin of the names used.

An interesting portion of the work i that in which the author discusses the alleged deterioration in quality of pape produced in modern times. And th subject is of importance seeing the dependence the future historian will hav to place on current literary records. Th fact is, of course, that when the use of paper is willing to pay the price, h can obtain thoroughly good paper, th truth being that consumers often expec to get nowadays for two or three penc what they formerly had to pay a shilling for. What are needed are proper standards of quality.

Mr. Sindall goes into the whole subjec of materials for paper-making, and ha chapters devoted to rags, esparto, straw wood pulp; also on the chemical constituents of paper; what is revealed o the fibres under a microscope, analysi of a sheet of paper; the C.B.S. units etc. Besides thirteen plates, the book which is handsomely bound and printed has 158 illustrations. For all those wh want a complete manual of the subject which is also written in popular language, we can thoroughly recommend it

BRITISH IMPORTS OF PULP.

For the seven months ended July, the receipts of chemical wood pulp in Great Britain were:—Chemical dry, 135,206 tons, £1,157,755; wet, 9,788 tons, £39,532. Compared with the corresponding period of last year dry shows an increase of 10,914 tons and £94,273, and wet a decrease of 1,532 tons and £6,492. There was a falling off in the imports of mechanical wood pulp into the U.K. last month. Dry was received to the extent of 495 tons of the value of £2,144, and wet to the amount of 32,817 tons of th value of £77,916, a drop of 163 tons i dry and 7,389 tons in wet, with corresponding decreases in value of £525 an £11,024 respectively. Taking the seve months' figures, the imports of dr were 1,681 tons of the value of £7,567 and wet 199,039 tons valued at £449,813 Whilst dry, compared with January-Jul of last year, shows a reduction of 2,80 tons and £11,489, wet was received mor largely to the amount of 6,237 tons wit an increase in value of £21,979.

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* Paper Technology: An Elementary Manual on the Manufacture, Physica Qualities and Chemical Constituents of Paper and of Paper-making Fibres. B R. W. Sindall, F.C.S. Charles Griffin & Co., Limited, Exeter Street, Strand London, W.C. Price, 12s. 6d. net.

THE MARKETS.

Toronto, Sep. 14, 1907.

Pulp.—The news from Norway that the pulp mill employees have resumed work has just come in time to prevent all ideas about pulp prices going absolutely sky-high. But that is all that can be said. Every other consideration conduces to even greater firmness in the situation than has prevailed all summer. The water both in Canada and New England has been extremely low, though the precipitation last week should help greatly. On the Chaudiere, pulp-wood has been on the short side, but the shortage would scarcely have been sufficient to check mill operations had it not been for the low water. Mills depending on the Hudson River for power have been in the same predicament. There is very little pulp in stock anywhere that we know of. Ground wood is hard to obtain at $22 to $24, and some, we hear, has sold recently at $25. Sulphite is $2.50.

Paper.—A brisk trade is being done in all lines of paper, and while there was no appreciable slackness of business before, it may still be said to have visibly increased during the present month, and since the close of the Exhibition. No special advance has taken place in news, but sheet news sells at $3, and in some cases $3.25. All lines of book cover, poster, lithograph, catalogue, and similar light weight papers have made another advance, and are held very firmly. In writing papers, especially of the finer kinds, considerable quantities are coming in from England.

British.—There is a growing scarcity of sulphite, especially for better qualities, and high quotations are, therefore, obtainable without difficulty. Makers report themselves well ahead at satisfactory prices. Soda pulp is scarce and dear. Very little mechanical pulp is obtainable for delivery this year and still higher prices may be expected. For next year's delivery makers are more reasonable, but business is difficult.

Chemicals.—There is a fair home and export demand for chemicals. Prices are well maintained. Ammonia alkali, 58 per cent., stands at £4 10s to £4 15s.; cautic soda, 77 per cent., is quoted £10 10s.; bleaching powder, soft wood, £4 15s. on rails at works; soda crystals, £3 to £3 2s. 6d.; and salt cake, £2 f.o.r. Sulphate of copper is lower at £27 5s., and blanc fixe firmer at £6 10s. f.o.b Tyne.—World's Paper Trade Review.

PAPER STOCK MARKET REPORTS.

Montreal, Sept. 15, 1907.

While there is a fair demand for most lines of paper stock, the course of the market is a little uncertain. The advance in the price of wood pulp, followed now by a probable shortage in the supply of straw for paper-making, has increased the demand for waste papers of all kinds, and some shipments of these are coming across from Europe. Considerable shipments of satinet for roofing felt stock are also coming over, but the demand for these is not as active as it was. The scarcity of money is affecting some of the smaller packers, and when there is not a ready sale for some of their lines, particularly bagging and cottons, there is a disposition to sacrifice them.

This cannot continue, as stocks here are small, and the complement comes from Europe, where prices are firm, and will control prices here, as soon as these small lots are marketed

New cuttings are not in as good demand. This is usual at this time of the year, when water is low and many mills close for repairs.

Manilla rope has reached a normally low level of 2½ to 2¾c., where it is likely to remain for some time.

Bagging is relatively at the lowest value of any line of paper stock. The reason is not apparent, there are some accumulations, and scarcely any sales

Quotations are as follows:—

Unbleached cuttings	4.50	to	5.00
White shoe clips	4.50	to	5.00
Colored shoe clips	3.00	to	3.25

Domestic white rags	2.25	to	2.50
Blues and thirds	1.25	to	1.50
Roofing stock	.90	to	1.00
Manilla rope	2.50	to	2.75
Waste papers	.90	to	.45
Bagging	.90	to	.—

TRADE ENQUIRIES.

The following enquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these enquiries, with their addresses, can be obtained upon application to Superintendent of Commercial Agencies, Department of Trade and Commerce, Ottawa, or publishers Pulp and Paper Magazine.

965. **Wood Pulp.**—An Austrian firm desires to get into communication with Canadian exporters of pulp wood.

1008. **Paper and Pulpboard Mills.**—A London firm with branches in Glasgow, Manchester and Dublin, wishes to hear from Canadian paper and pulpboard mills wishing to dispose of their production in the United Kingdom. Wrappng papers a specialty.

1010. **Wrapping Paper.**—A Lancashire company wishes to get into communication with Canadian buyers of brown wrapping and very stout packing paper.

"A London firm of Wholesale Stationers is open to buy large quantities of sized wood pulp boards."

FIRE AT EDWARD PARTINGTON PULP AND PAPER COMPANY'S MILL.

The Union Point Pulp Mill, owned by the Edward Partington Pulp and Paper Company, St. John, N.B., was damaged by fire a few days ago. The blaze started in the conveyor shaft, and the damage will be several thousand dollars, but will not affect the working of the mill to any great extent. The fire when first observed was near the bottom of the shaft, and made rapid progress up the wooden structure. The mill fire department at once got to work, and soon had five streams playing on the flames. The big fire pumps close to the bank of the river did magnificent work, and very likely could have coped with the fire without the assistance of outside apparatus, though engines were sent both from St. John and Fairville. Before the fire was subdued, however, the endless belt of the conveyor was practically destroyed and the top of the shaft burnt away as well as the sides being damaged. The chip-loft to which the conveyor runs from the lower part of the mill was practically undamaged. The mill itself which is built of brick with floors of concrete and ceilings of arched brick, was not damaged with the exception of the roof, which was burnt a little. The origin of the fire is unknown. By some it is ascribed to a hot-box, but others say that there were no journals near the point where the fire first broke out. Another theory is that fire was carried up in the chips by the conveyor. The some 130 men employed in the mill will not be affected by the fire, as there was enough stock on hand to keep the mill working for a few days, after which it was shut down and repairs to the conveyor made.

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—It should not be thought that the agitation for restricting the export of pulp-wood from Canada is confined by any means to Quebec or Western Canada The question is a live issue in the Maritime Provinces as well, especially in New Brunswick, where the quantities of wood shipped to the United States are constantly increasing. Evidence of the feeling which prevails is given by the discussion at the Maritime Board of Trade Convention, recently, which passed a resolution in favor of the Dominion Government prohibiting its export altogether.

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Charles Lynn, an old employee of the Ritchie & Ramsay Coated Paper Mills at New Toronto, Ont., has resigned his position to go to Kalamazoo, Mich.

DIFFICULTIES IN PREPARING SULPHITE LYES.

Processes in which sulphite lyes are made by passing sulphur dioxide, made by burning sulphur into milk of lime, have found great favor. They are simple and easily regulated, and the necessary apparatus is cheap, takes up but little room, and rarely requires any expenditure on repairs. It has, however, its disadvantages. One is that some of the burnt sulphur forms sulphuric acid; another is that in attempting to avoid the formation of the trioxide by restricting the air supply we often get a sublimate of unburnt sulphur. Yet another is the formation of calcium sulphate in the absorption vats. Again, the chance that the health of the workpeople may be endangered by escape of sulphur dioxide must not be overlooked. The difficulty lies in the construction of the oven in which the sulphur is burnt. Deficiency of oxygen means sublimation of unburnt sulphur. Excess of that gas means the formation of corrosive oil of vitriol. Hence the stove must be so built that the amount of oxygen is just right. The manufacturers of sulphuric acid have had to meet this same difficulty. The stove must also be so constructed that the temperature does not rise too high. A heat of about 500 degs. C. is the most favorable one for the production of sulphur trioxide. Higher temperatures decompose it again, but it is evident that economical considerations dictate that the temperature should be kept below 500 degs. The gas from the burning sulphur must not be allowed to come into contact with catalytic agents, such as rusty surfaces of iron. These bodies act powerfully on mixtures of sulphur dioxide and oxygen, even at temperatures below 500 degs. C. When sulphur dioxide is made by burning not sulphur, but pyrites, oxide of iron is apt to be carried over mechanically in the form of fine dust.

Any sulphuric acid formed condenses, for the most part, in the condensers below the stove and the cellulose vats. It rapidly destroys the condensers, and some of it always passes over into the vats. If sulphur is sublimed, it is not only wasted, but soon chokes the pipes, while so much of it as gets into the pulp makes yellow stains later on in the finished paper.

The formation of calcium sulphate in the absorption vats is practically inevitable if hard water is used. If any considerable quantity of it is produced it is quite impossible to prepare clear lyes of the proper strength, i.e., from 3 to 4 per cent. of sulphur dioxide, for the precipitation of the sulphate begins before the conversion of the sulphite into bisulphite by the sulphur dioxide is complete, so that not only is sulphur wasted in the form of the insoluble lime salt, but the lye becomes turbid, and produces marks in the finished paper.

The test of a good sulphur oven is that the gas it supplies shall contain at least 13 per cent. of sulphur dioxide. Ovens are to be had which, under skilful management, will give a gas containing 15 per cent. of the dioxide. The remainder should be practically all nitrogen. As the ovens work under pressure care must be taken that all the joints are sound, not only for economic reasons, to avoid waste of sulphur, but for sanitary and humanitarian reasons, in respect of the workpeople in the factory. It follows that a good sulphur stove has the minimum number of places where leakage must be possible. The lighting of the stove has to be skilfully done. If a red hot poker is used for the purpose and is put through a hole in the oven door, it must be left there until the oven is in full action, for if it is withdrawn the moment the sulphur begins to burn sulphur dioxide may be driven out of the hole by back draught to the detriment of the attendant's health and of the proprietor's purse. By far the best way of starting the oven is to throw in burning shavings, of course shutting the door at once.

Exactly the same ovens are required by the paper-maker, fortunately, as are needed in the manufacture of oil of vitriol, so that there are both British and continental types which are as good as is at present possible. Under very favorable conditions and with skilful firing some of the modern stoves will actually give a product of combustion containing 16, 17, or even 18 per cent. of sulphur dioxide, accompanied by a sulphur trioxide in such small quantities that its bad effect is almost imperceptible. From what we have already said it will be evident that a good sulphur oven is a combination of the best design, the best material, and the best workmanship, and yet may be useless in the hands of an incompetent or lazy attendant.—Papier Fabrikant.

WATERPROOFING PAPER.

T. H. Norton, United States Consul at Chemnitz, furnishes the following particulars in regard to the new processes of treating paper so as to make it waterproof or parchmentlike:—

There are several methods now in vogue here for rendering paper and pasteboard waterproof which might advantageously be utilized in the manufacture of paper and cellulose vessels. One, especially applied to cellulose, consists in treating the sheets with a hot mixture of asphalt, turpentine and linseed oil solution of glue. Another consists of saturating cellulose articles in a solution of resin in a mixture of petroleum, linseed oil and paraffin oil. Solutions of varnish in linseed oil are likewise employed for rendering a surface waterproof.

A process which has given good results is the following: Articles of paper or cellulose are soaked thoroughly in a solution of resin soap. They are then immersed in a hot bath of zinc chloride, passed between rollers, are well washed, dried in a hot room, treated with paraffin oil, and finally run through a calender. The resultant products are strong, tough and pliable. A waterproof pasteboard is secured by immersing sheets of ordinary paper in a bath of nitric acid or the solution of a nitrate, placing the sheets one on top of another, and then submitting them to heavy pressure. I am personally inclined to regard experimental methods, based upon the fundamental principle of changing paper into vegetable parchment, as promising the most success in this field. Waterproof cardboard has already been manufactured by pressing tightly together freshly prepared sheets of the vegetable parchment before being dried.

The operations in parchmentizing paper, like those in tanning, are essentially chemical, and effect a remarkable change in physical properties. When carried out with partly diluted sulphuric acid (two parts acid of 66° to one part water) sheets of pure cellulose paper are immersed for a few seconds in the liquid, then thoroughly washed in water, dipped in an alkaline solution (ammonia or sodium carbonate) and washed again. This brief treatment suffices to bring about the following changes: The thickness of the paper decreases from 34 to 37 per cent. Its specific weight increases in the same ratio. The strength is tripled and even quadrupled. There is a notable increase in homogeneity and transparency. The product is unaffected by boiling water, i.e., is not softened and disintegrated, as is the case with ordinary paper, while it has an increased affinity for tinctorial substances.

Chemically, the brief exposure to the action of sulphuric acid has changed the exterior of the cellulose fibres to a gelatinous mass, the so-called amyloid, intermediary between cellulose and dextrine. This gelatinous amyloid binds the fibres so closely and intimately together that they form a continuous mass, which, being totally insoluble, constitutes a waterproof substance. With the microscope it is easy to see that parchment is a sheet of cellulose fibres, each one of which is covered by the thin, transparent coating of amyloid, the interstices or pores likewise being completely filled with the same substance. It is essentially a surface action which has taken place. Ideal conditions of success are relative thinness of the paper employed and a complete absence therein of gluey substances and mineral matter. Sulphite acid can be replaced by an aqueous solution of zinc chloride or an ammoniacal solution of cuprous oxide.

In order to render paper vessels waterproof, the essential features of the parchmentizing might be applied to their external surface. This would involve no material increase in the strength of the entire mass. Another and possibly more promising method would be to apply freshly formed sheets of vegetable parchment under strong pressure to the inner and outer surfaces of the article. It will probably be found that improvements in the manufacture of paper vessels, aiming at an increase of tenacity, can preferably be brought about by mechanical operations quite distinct from the chemical reactions producing waterproofing, although both of these advantages are secured by a single change in the case of the preparation of thin sheets of paper parchment.

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PULP FOR ROOFING PAPER.

It is impossible, says the "Svensk Pappers Tidning," to replace half wool in roofing paper by sulphate cellulose, as the wool serves not only to make the felt porous, and so easily soaked with tar, but to increase the durability of the material. More than one hundred attempts to make good roofing felt without wool have shown that from 30 to 40 per cent. of wool is indispensable to obtain a really good article. Mechanical pulp, chemical pulp, jute, cotton and linen were all tried, but the felt produced would not stand the direct rays of the sun or atmospheric influences, especially rain and low temperatures. The felts subjected to these agencies soon became crumbly and brittle, unless they contained at least the percentage of wool above given. Another point is that the presence of wool lessens the expansion of the felt in hot weather. Felts without wool are rapidly destroyed by alterations of expansion and contraction, due to variations of temperature. In hot weather they get full of creases and blisters, and in cold weather they contract so much that they get full of cracks, and cease, therefore, to be watertight, independently of the fact that a strong wind will tear them to pieces. In the early days of the manufacture of roofing felt it was made of wool without the admixture of any other textile fibre; but experience has shown that if the mass contains at least one-third of wool the felting powers of the animal fibre are sufficient to admit of the remainder consisting of the cheaper vegetable fibre. Felts made of half linen, half wool, have been dug up in Sweden, which the coins wrapped up in them show to be at least 1,000 years old, and they were in a good state of preservation; the weakened fibres were most of them linen, and where the linen was sound it was in such a position that it was protected by the wool. It is remarkable, however, that the scaly exterior of the wool fibres had to a large extent disappeared.

❦

LOWDEN'S IMPROVED AUTOMATIC STEAM PRESSURE REGULATOR.

The paper manufacturers of the present day desire that their large fast-running paper machines be equipped with all the best improvements to prevent waste or breakages of paper, and it is noticeable that most of the new paper machines built for Canada, the United States, and Great Britain, are equipped with Lowden's Improved Automatic Steam Pressure Regulator, of which James J. Lowden, P.O. Box 837, Washingtin, D.C., is the patentee and proprietor. The Lowden Regulator was first applied to paper machines and rotary bleachers twenty-five years ago, and has gradually gained the favor both of paper manufacturers and paper machinery builders. The patentee claims that they can be applied to paper machines where exhaust is used, or exhaust and direct steam combined, and relieve engine from back pressure in the operation, thus making a great saving of steam, insuring uniformity in drying, and freedom from water streaks. A special advantage is in case of breaks at the press-roll, the pressure remaining the same on the dryers, while no paper is running over dryers, thereby maintaining an even temperature. They are always at the right temperature, when the paper is carried over, to dry the sheet exactly right for carrying through chilled rolls. Quite a number of the paper machines in Canada are without these regulators, and particulars may be obtained from the patentee, whose announcement is on page 10 of this issue.

PAPER MAKERS CHEMICAL COMPANY.

The Paper Makers Chemical Company, of Easton, Pa., which has enjoyed a steadily increasing business for the past twenty years has taken over the business of John Knight & Co., the pioneers of the china clay trade in the United States and Canada. Mr. Knight remains with the new company, taking the active office of president. The company has the sole agency for the celebrated L.G.V. China Clay, a perfectly pure white natural colour clay (coating) free from any artificial tinting, and unsurpassed in coating and bleaching. They also handle various grades of filling clays, being interested in twelve mines, and are also manufacturers of "Superior Rosin Size" of any percentage of free rosin or dry matter required, also special sizes, such as Superior Coating Size, a combination of casein and rosin. Another well-known commodity made by this firm is the Excelsior Felt Cleaner, which they claim to be the only soap on the market that leaves the felt soft and pliable, and does not destroy the nap.

* * *

—We have received from the Government Printing Bureau, Ottawa, four maps published by authority of Sir Wilfrid Laurier, president of the Privy Council, showing respectively: "Mounted Police Stations in North-Western Canada, Eastern Sheet"; "Mounted Police Stations in North-Western Canada, Western Sheet"; "Mounted Police Stations in Alberta and Saskatchewan," and "Canada, Territorial Divisions."

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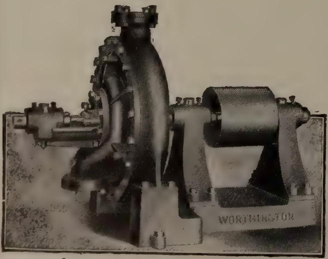

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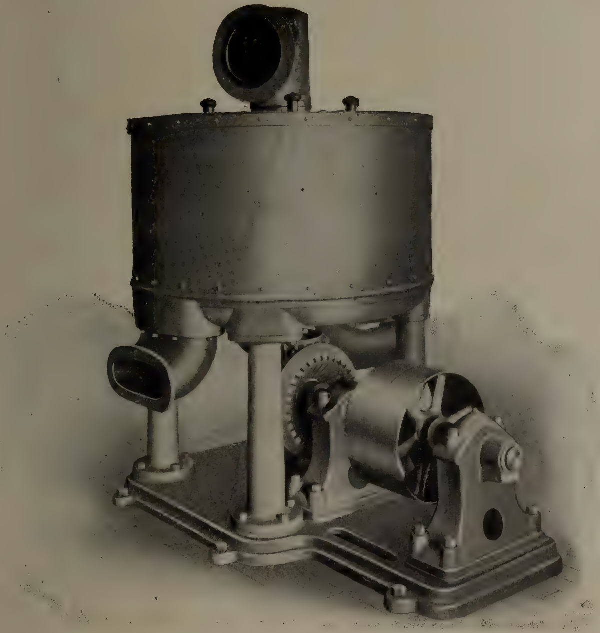

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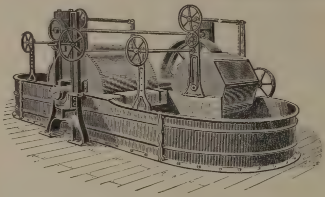

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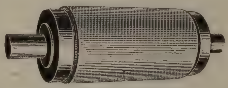

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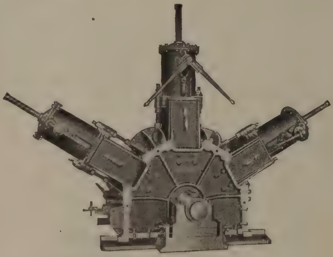

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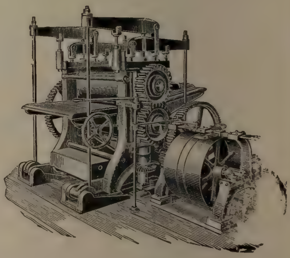

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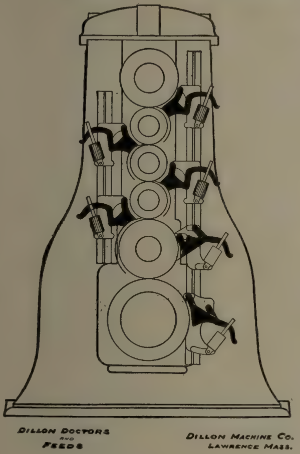

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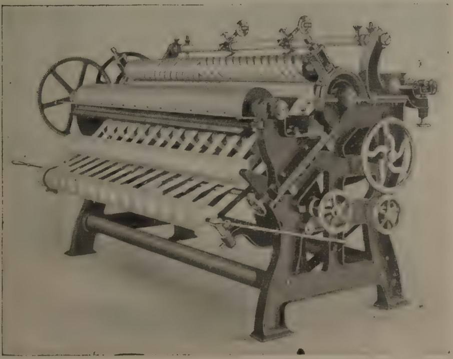

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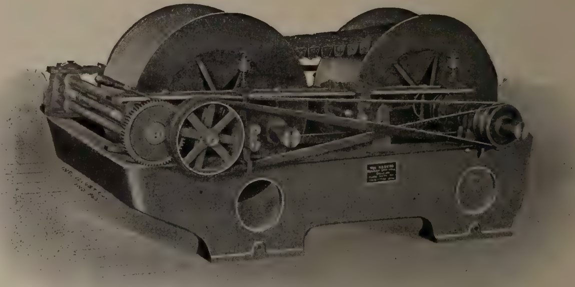

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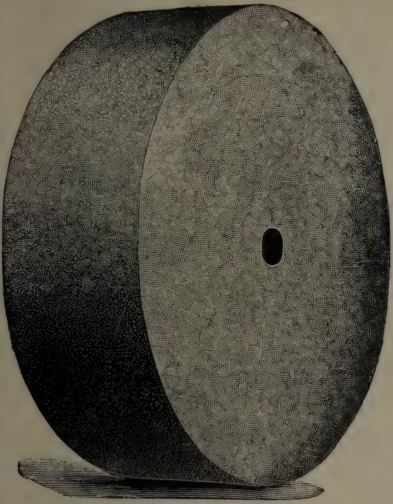

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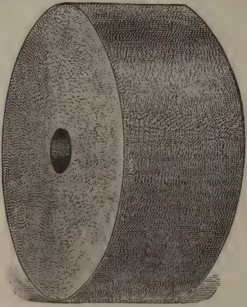

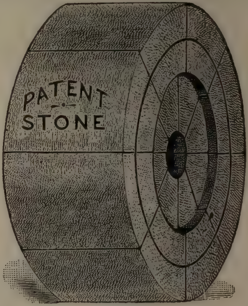

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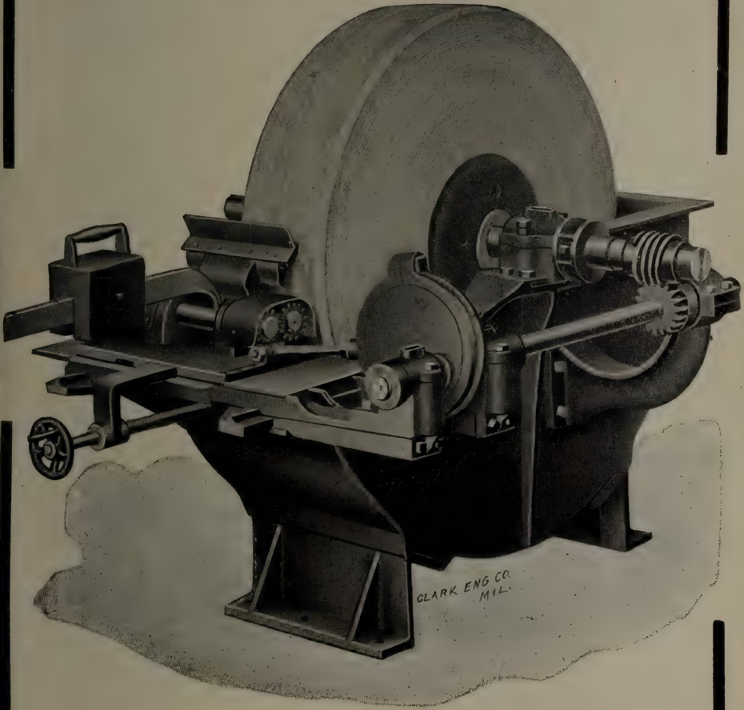
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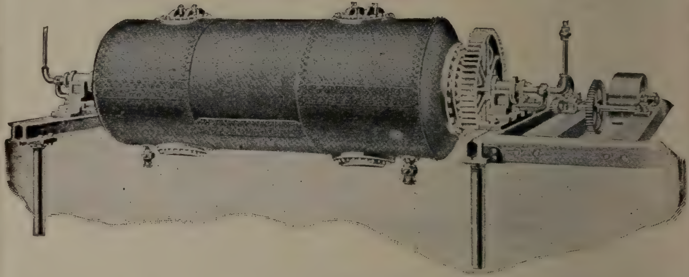

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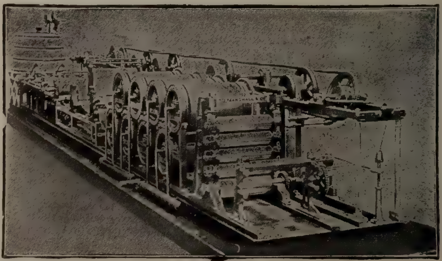

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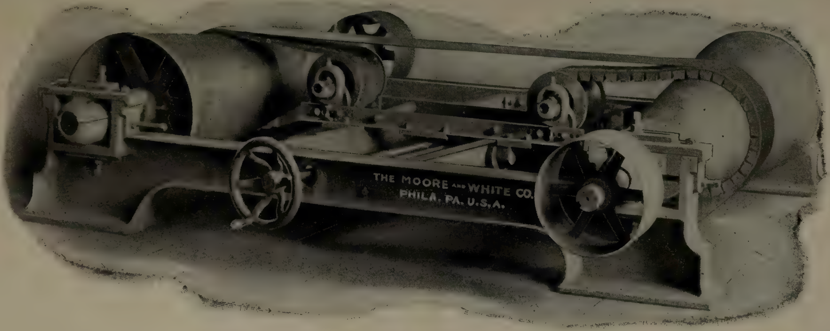

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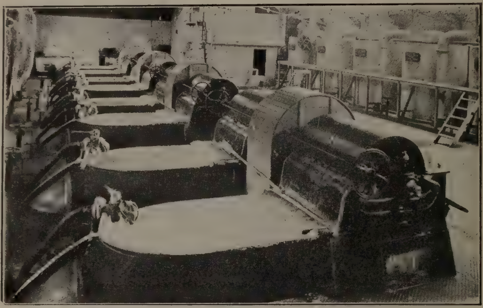

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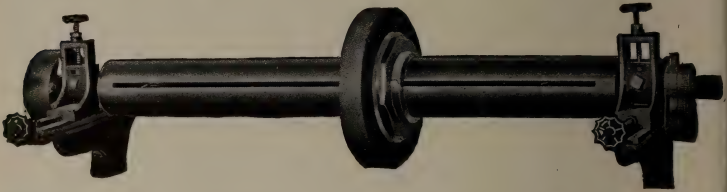

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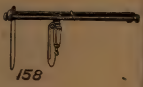

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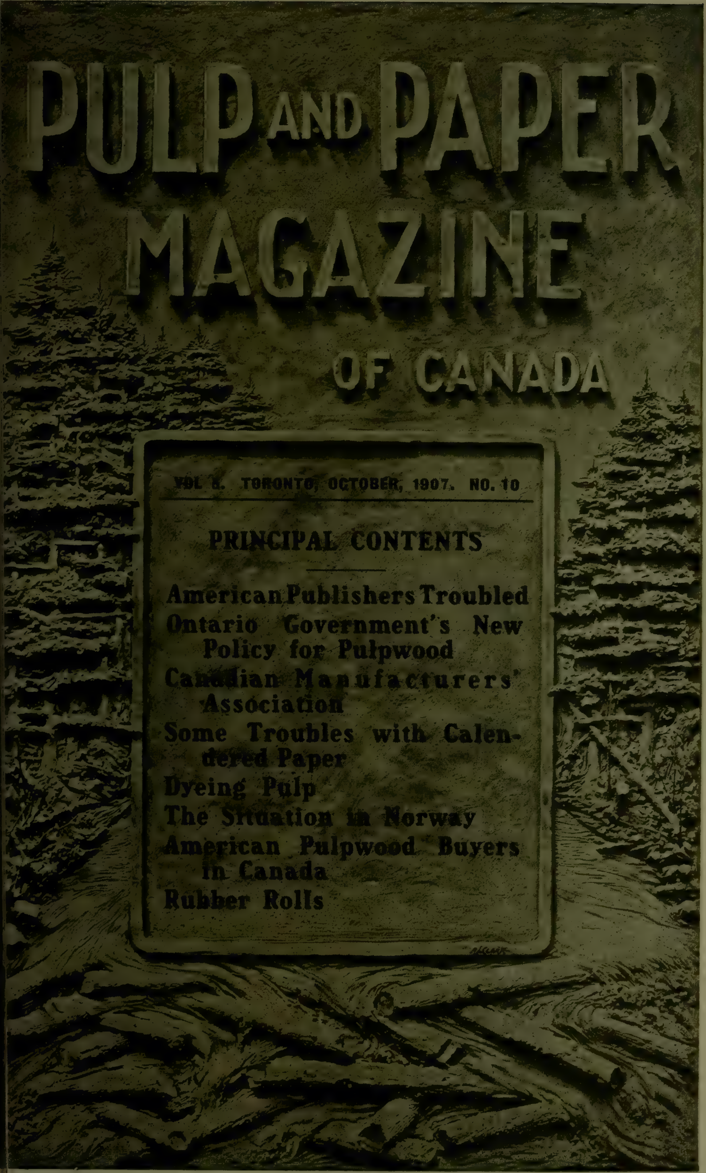

PULP AND PAPER MAGAZINE OF CANADA

VOL 5. TORONTO, OCTOBER, 1907. NO. 10

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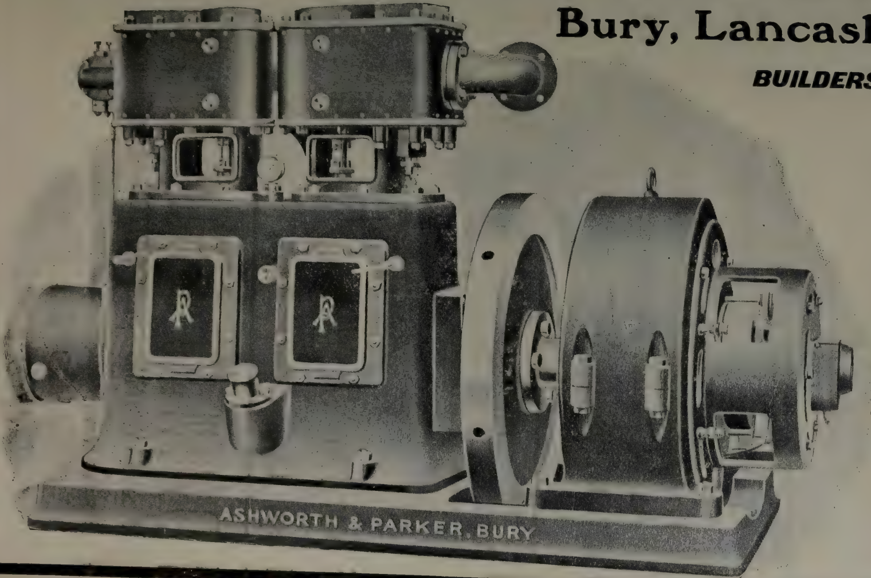

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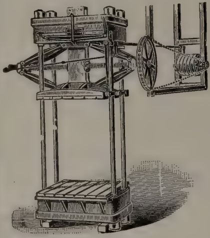

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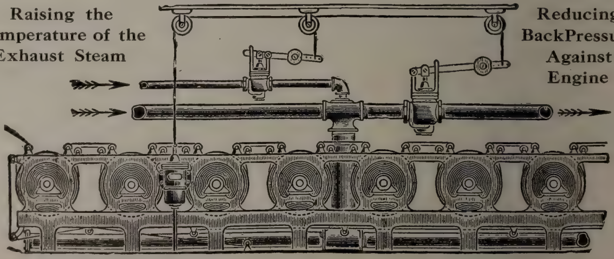
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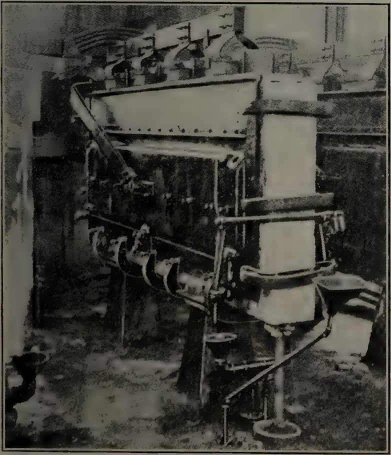

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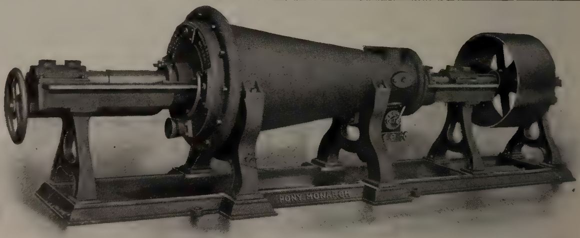

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THE

PULP AND PAPER MAGAZINE OF CANADA

Vol. 5.—No. 10. TORONTO, OCTOBER, 1907. {$1 a Year / Single Copy 10c.

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade

Subscriptions: Canada, British Empire and the United States, $1 a year; to Foreign Countries, 5s. a year.

The Pulp and Paper Magazine is published on the third Tuesday of each month. Changes of advertisements should be in the publishers' hands not later than the 10th of the month, and, where proofs are required our days earlier. Cuts should be sent by mail, not by express.

BIGGAR-WILSON, Ltd.,
PUBLISHERS
Offices, Confederation Life Building,
Toronto, Canada.

AMERICAN PUBLISHERS TROUBLED.

Newspaper publishers in all parts of the United States met in New York, under the auspices of the Associated Press and the American Newspaper Publishing Association, and hurled defiance at the manufacturers of paper. Not appeased by the evident troubles of the latter, the publishers charged them with having formed an illegal combination to keep up the prices of news paper, and threatened to carry an action in every court of the land, to have said "combination" quelched. President Roosevelt is to be called on, and if possible, the United States tariff against Canadian paper is to be abrogated in order to bring the paper-makers of that country to their senses. Canadians in the paper manufacturing trade will of course take no objection to this latter, though it may be said for the rest that they feel a good deal of sympathy for their American brethren, for the same conditions that are bringing added expense to the production of paper in the one country are bringing the same thing in the other.

We fancy the best thing the publisher can do is, not to start out on a truculent campaign against the manufacturer of paper, which in the ordinary course of events, will make matters worse, but rather to sit down calmly with him and reason the thing out. The recent advances in news paper have not come about through a desire on the part of the paper-makers to make an undue profit out of the publisher, but simply because they had to get more money or quit business altogether. As a matter of fact, the advances ought to have been made much sooner, and they ought to have been larger than they have been actually. We hazard the prophecy too that if the rise in price, does not go even considerably higher than its present range, all concerned, including the newspaper publishers, will have a great and surprising deal on which to congratulate themselves.

The publishers ought to get together and talk the situation over with someone who can tell them frankly and disinterestedly the facts. Granted that at the present price at which the big dailies are sold there is but little profit in circulation; that does not imply that the manufacturers of paper should be under any necessity or obligation to reduce the selling price of their commodity below cost to enable the former to continue selling at their old rate or to enable publishers to keep to the present large size of their papers. One suggestion which occurs to an onlooker is that the publishers, if they cannot afford to sell their papers at the present price and of the present size, should either increase that price or reduce the size.

One thing is certain. Unless the conditions which now prevail in the paper trade change to an almost impossibly radical extent, there can be no reduction in the price of news for some time to come; indeed, it is difficult to see how such reduction can come at any time. Nature will attend to that in the practically irreparable diminution of the supplies of pulp-wood, out of which to make the paper.

Briefly stated, the reason why the cost of paper has had to be advanced in the United States, and practically the same reasons apply in Canada, is simply the extraordinarily increased expense incurred in making it. The price of labor, through higher wages and alteration in time schedule is 50 per cent. higher than it was less than a year ago. Pulp-wood costs at least $2 per cord more, and the cost of getting it out, owing to diminishing accessibility of the supplies, is higher. The cutters who get these supplies receive higher pay; their wages now averaging probably at least 50 per cent. more than five years ago. Chemicals also are nearly 50 per cent. higher than they were two years ago. Coal and felt and other subsidiary paper-making materials all cost more. Besides these natural causes, there are others of a more or less artificial or temporary character which have all acted in the same direction. Strikes and lock-outs in Norway and Sweden cut off, during a large part of the summer, the supply on which England largely depends. Drought and lack of water-power were another factor which disturbed the situation on this Continent. Added to all this, the demand for paper has been constantly increasing, with the result that stocks have been in a chronic state of depletion. Is it any wonder that the paper manufacturers in simple self-defence and to save themselves from serious losses, had to put up the price of their product, and not before such a course was badly needed?

ONTARIO GOVERNMENT'S NEW POLICY RE PULP-WOOD.

The many inquiries recently made for pulp-wood areas in Ontario have caused the Government to go carefully into the whole question with a view to a more restricted utilization of the Provinces resources in that regard. Its plans will receive practical illustration in its invitation for tenders to be issued shortly, for the Nepigon and Fort Frances concessions. These pulp-wood areas, it will be remembered, were covered by concessions granted some years ago, but were cancelled because of non-fulfilment of the terms of the agreements. In the case of the Nepigon concession it is said that the territory will not be so extensive as that comprised in the original concession. The agreements will no doubt embrace conditions as to the size of the timber to be cut, the length of time which the concessions are to run, the amount of money to be expended within a specified period on mills and other works, and the dues to be paid for any pine timber cut other than pulpwood, as well as for the latter.

It is probable that these concessions will be the last to be offered for some time to come, for while every year's work of the Provincial survey parties is proving the truth of the statements of those who made the preliminary surveys of New Ontario as to the immense extent of the pulp-wood resources, much of it is at present commercially inaccessible, though the contemplated extensions of railways will add immensely to their value.

It is not the intention of the Government to interfere with concessionaires whose agreements already give them the right to export pulp. In all the concessions so far granted it is expressly provided that the wood must be manufactured into pulp or paper in Ontario. Those, however, who entered into contracts with the Government did so presumably in good faith, and it is considered that it would be unfair to attempt to change them now, particularly where there is no doubt as to the earnestness of the parties trying to keep their agreements.

QUEBEC POLITICS AND LAND DEALS.

The resignation of Hon. Jean Prevost, Minister of Colonization, Mines, and Fisheries, from the Quebec Cabinet, brings back to mind the Baron l'Epine revelations. It will be remembered that it was asserted that a Belgian syndicate had negotiated with the Quebec Government for the purchase of a certain parcel of land containing about 200,000 acres, and that the price paid, although claimed to be $1 per acre, was really only 70c., the balance, it was alleged, being transferred into the party campaign fund. Meanwhile the whole Province is talking graft and corruption, and the peculiarly flagrant manner in which the Province's great forest resources have been apparently squandered is receiving the condemnation which, if the statements are to be believed, it so richly deserves. Hon. A. Turgeon, it may be said, referring to the Breakey charges, states they are false from the start. And he produces documents which are supposed to prove that the limits in question had been for sale for three years; that there had been no bidder at $60 or even at $55; that in the month of June, 1905, they were put up in separate blocks at $125, and not at $400, as stated by Mr. Bourassa. It was not true, he said, that Mr. Breakey had resold the limits at a profit of $695,000. The Burgess Sulphite Co. had bought not for $800,000 nor anything like that amount, but for $300,000 not only Mr. Breakey's limits, but also La Tuque Water Power for which $50,000 had been paid, the land subsidy granted the Quebec & Lake St. John Railway for La Tuque branch, and also a special tariff of rates over the line of that railway for the conveyance of their freight. The resignation of Hon. Mr. Prevost in spite of his strong assertion only a few days ago that he harbored no such intention, looks as though the government is determined to sacrifice some one to appease the popular clamor. His friends state the step is taken to place him on an independent footing in regard to pending libel suits.

ANOTHER ASPECT OF PULP-WOOD EXPORT.

A sentence in a letter recently written by Ex-Senator J. M. Woods would seem to suggest another argument, if any were needed, for immediate legislation to restrict the exportation from Canada of her stores of pulp-wood for the building up of a rival nation's industry. As our readers are aware, there is now being conducted in Massachusetts and other New England States a vigorous campaign in favor of reciprocity with Canada. Hon. Mr. Woods in this communication to the Boston Transcript stated that "Ex-Governor Douglas, in a letter to me last year, arguing for putting lumber on the free list, advised letting Canadian lumber come in free, until the Canadians exhaust their supply, we letting our forests grow." A somewhat cynical remark, and, in view of the American shortage of pulp-wood, one that should cause Canadians to think even more deeply than they have already done, over their present policy of speeding their parting supplies over the border. Mr. Douglas became Governor of Massachusetts largely on a reciprocity platform, and H. M. Whitney is now seeking that office on a similar basis. But there is little doubt that the only reciprocity the New Englanders care about is to get all of Canada's raw materials as cheaply as possible, and to ship back the manufactured articles in which there is the largest share of profit. In other words, we can hew wood and draw water for them (while they last) at a pittance, and they can convert them into something worth while and pocket the reward. The strongest reason for putting an export duty on pulp-wood or prohibiting its exportation altogether is not this tu quoque argument; but certainly it makes an additional one of which our American friends would be quick enough to see the force.

* * *

PULP AND PAPER NEWS.

The Chicoutimi Lumber Company is exporting large quantities of wood pulp to Europe.

* * *

The Poole Publishing Co., Toronto, has assigned, with liabilities of over $35,000, and assets stated at $25,000.

* * *

Hugh C. Maclean, publisher of the Winnipeg Commercial, has completed arrangements for buying out the Mortimer Publishing Company, Toronto, who issue several trade journals.

* * *

The Cascapedia Trading Company, which owns about 1,700 square miles of lumber limits in Bonaventure County, Que., proposes to erect shingle and pulpwood mills at Dalhousie, N.B.

In spite of the dry summer, reports from the Upper Ottawa indicate that not much pulp timber is stranded there, though in the tributaries the low water is causing some difficulty in that respect.

* * *

Tummer & Co., Campbellton, N.B., have sold their sawmill in Bathurst, N.B., extensive, and timber areas in Gloucester County, to United States capitalists, the price being about $250,000.

* * *

The West Canada Publishing Co., Winnipeg, Man., have been incorporated with a capital of $40,000 to carry on a printing and publishing business. The provisional directors include M. Dalton and J. T. Murray, Winnipeg.

The Carter-Crume Company, and the Morton Company plants and stocks in Toronto were last month damaged by fire. Loss $15,000 and $7,000 respectively, covered by insurance. Both companies manufacture check-books.

* * *

The Benson Lumber Truck Company, Port Arthur, has been incorporated with a capital of $20,000 to make trucks and other lumbermen's machinery. G. S. Clark, of Port Arthur Ont., and E. L. Mattson, of Minneapolis, are interested.

* * *

The Waters Printing & Publishing Co., Ltd., Montreal, capital, $49,000, has been granted a charter authorizing it to acquire as a going concern, the printing business now carried on in Montreal by the Waters Printing Company, and to manufacture, buy, and sell bound books, typewriters' supplies, and general stationery.

* * *

The Ontario Government's guarantee for the $1,000,000 now remaining of the loan of the Consolidated Lake Superior Corporation, has been extended for six months owing to the present tight state of the money market. The company's annual meeting was to have been held in New York a few days ago but not enough of the directors were present to form a quorum. The old officers will therefore continue in office.

* * *

J. J. Remo, of Rhinelander, and several other Wisconsin pulp manufacturers, have lately been examining the territory in the vicinity of Ely, Minn., and along the Canadian border, with a view to finding supplies of spruce pulpwood. The investigations of these prospectors are said to be likely to go still further afield across the border, and the upshot will perhaps be the erection of a series of mills in the Northern Pacific and Duluth, Rainy Lake and Winnipeg country.

* * *

Ernest Hutchinson, of Douglastown, N.B., has sold his large lumber interests near Chatham, N.B., including 45 square miles of timber land, and a saw-mill, and 300 square miles of leased crown lands, to United States capitalists, who are said to represent the International Paper Company, and who contemplate building a pulp and paper mill. The price paid was about $250,000. The same people are said to be negotiating for Alex. Gibson's lumber and milling interests at Maryville, and the deal is understood to be practically completed. It seems that, for people who have no particular need for Canadian pulp, that the Americans are showing a surprising hurry to get hold of it.

AN ENGLISH JOURNAL ON CANADIAN PULP.

Several Canadian papers are agitating against the sale of spruce lands to the great paper interests of the U.S.A. Far-seeing men in Canada are protesting against the policy which permits this waste of the national resources. Pulpwood—worth something less than six dollars a ton—is converted into high-class pulp, and into the finished article, worth respectively four times and six times that amount. The export of pulpwood to the United States could be easily prevented and the transfer of American mills to Canada ensured were the policy of the Ontario Government in this respect adopted throughout the whole of Eastern Canada. Ontario compels the manufacture within the Province of all timber cut on the Public Domain, and the result has been made manifest by the important pulp and paper mills that have sprung up in consequence. From an industrial point of view, a first-class paper mill in Canada means the permanent establishment of a town with five to fifteen thousand inhabitants, and is of much greater consequence to the country than a dozen saw mills. The results of which are more or less of a temporary nature. Canada's possessions of the best raw material in practically unlimited quantities for the paper industry must secure for her a dominant position in the world's paper industry in the immediate future.—Paper-Making.

NEWS OF THE MILLS.

W. H. Rowley, president and manager of the E. B. Eddy Company, Hull, Que., has been on a business trip to the Maritime Provinces.

* * *

J. R. Booth is receiving a constantly increasing number of orders for paper from the United States, as well as from England, Japan, Australia, and other countries.

* * *

At the Imperial Paper Mills, Sturgeon Falls, Ont., one machine started up about the middle of last month and another last week. Help is apparently to be obtained now in the district without much difficulty.

* * *

The Lincoln Paper Mills Company, Ltd., Merritton, Ont., is bringing an action against the Niagara, St. Catharines and Toronto Railway Company, to restrain the latter from filling in a pond near the former mill.

* * *

The Brompton Pulp and Paper Co., East Angus, Que., are turning out sulphate pulp and kraft papers. Samples of the kraft are said to compare favorably in strength and general appearance with that made in Scandinavia.

* * *

H. G. Turner, the engineer appointed by Senator Edwards, Rockland, Ont., to investigate as to best location for pulp mills on the north shore of New Brunswick, is said to be favorably impressed with the facilities offered by both Bathurst and Petit Rocher. The latter is well endowed with pulp-wood, and it has also considerable shipping advantages.

* * *

The Northern Islands Pulp-wood Company, Ltd., Port Arthur, Ont., has been granted a charter authorizing it to manufacture and sell pulp-wood and all by-products of lumber, manufacture fibrous products, etc. The capital is $100,000. Among the provisional directors are A. J. Richardson, of Wyandotte, Mich., and D. A. Nicholson, Detroit.

* * *

The Canadian Paper Bottle Company, Toronto, has received an Ontario charter authorizing it, among other privileges, to manufacture pulp, paper and any product of these, build mills, etc. Capital, $125,000. R. B. McClure, publisher, and C. M. Gage, of New York, and H. W. Murray, solicitor, 18 Toronto Street, Toronto, and G. M. Kelley, solicitor, 19 Wellington West, Toronto, are interested.

* * *

Newcastle, N.B., town council has appointed a special committee to act with one representing the local board of trade, to enquire into the question of titles, etc., in connection with the proposal of James Beveridge, formerly of the Miramichi Pulp & Paper Co., Chatham, Ont., to build a pulp and paper mill there. A location, however, has not, we understand, yet been decided on. A few days ago the employees of the Chatham mill waited on Jas. Brookes Beveridge, son of the late manager, and presented him with a handsome gold watch, chain, and locket, and a suitable address. Mr. Beveridge made an appropriate reply.

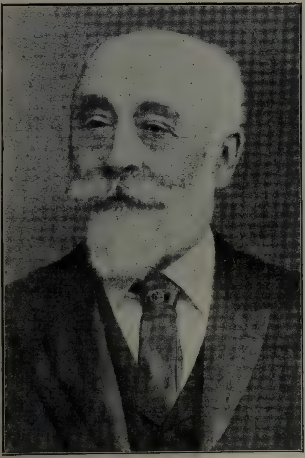
TRADE ENQUIRIES.

The following enquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these enquiries, with their addresses, can be obtained upon application to Superintendent of Commercial Agencies, Department of Trade and Commerce, Ottawa, or publishers "Pulp and Paper Magazine," Toronto.

1161. **Paper.**—A London firm wishes to get into touch with Canadian manufacturers who can supply roll news paper suitable for the South African market.

1288. **Woodpulp Stones.**—A stone merchant and quarry owner in Derbyshire makes inquiry respecting the demand for woodpulp stones in Canada.

CANADIAN MANUFACTURERS' ASSOCIATION.



Hon. J. D. Rolland, President of the Rollond Paper Company, the new President of the C.M.A.

A feature of the recent Convention of the Canadian Manufacturers' Association, in Toronto, at which the paper trade was honored by the election of Hon. J. D. Rolland, of the Rolland Paper Company, Montreal, as president, and of D. Lorne McGibbon, formerly manager of the Laurentide Paper Company, s vice-president for Quebec Province, as the great attention paid during the roceedings to forestry and pulp-wood uestions.

H. Cockshutt, the retiring president, oiced the feeling of a very large section f the manufacturers, as well as of the usiness public of Canada, when he exressed a strong sympathy with the proosal to place an export duty on pulpood. The United States consumed, he aid, 2,500,000 cords of pulp-wood every ear, of which Canada now supplied 25 er cent. "By allowing this material to ave our country in its unmanufactured state we are simply contributing to the upbuilding of our greatest industrial rival, whereas the imposition of an export duty would unquestionably compel the investment of United States capital in Canadian pulp mills, would provide employment for thousands of Canadian workmen, and would ultimately open the door for the sale of Canadian pulp across the border. Every year we defer our decision in this matter we relatively weaken ourselves and strengthen a highly protected competitor whom we already have reason to fear; moreover, we postpone the enjoyment of a prospeity which is well within our reach."

On the question of forestry too, Mr. Cockshutt came equally to the point. He said that per head of population Canada easily stood first among the countries of the world in forest wealth, with 148 acres of wooded land for every man, woman, and child within her borders. Norway and Sweden came next with about nine acres each, followed by the United States with only seven. Here was surely an estate worthy of the greatest care. And yet, if reports were true, huge tracts were year by year being devastated by fire, involving the loss of millions of dollars. These losses were particularly regrettable in view of the fact that many of them might easily be prevented by the exercise of greater care on the part of railway employees, settlers, prospectors, and hunters.

The whole question was one of such tremendous importance to Canada that it was surely time they were adopting a vigorous forestry policy. It seemed to him that the first step to that end should be a careful stock-taking of their national possessions. They must not lose sight of the fact that in that matter they were simply acting as trustees for posterity. He would favor the immediate creation of more forest reserves; particularly was it important that the heights of land where so many of their rivers found their sources should be under perpetual forest. He believed that no reasonable expense should be spared in providing their forest land with fire rangers sufficient in number to properly protect them. He was further of the opinion that legislation should be enacted making it a criminal offence punishable by imprisonment to expose their forests in any way to danger from fire.

The administration of such an estate was, he believed, of sufficient importance to justify the Government in creating a portfolio of forestry. In addition to the duties above referred to, a Minister of the Crown might render valuable service in encouraging the establishment of schools of forestry, where practical instruction would be given on a subject which seemed destined to form the groundwork of one of their foremost professions. He might also extend the scope of the tree-planting operations which the Government had carried on with much success for the past five years.

Dr. Fernow, Dean of the Faculty of Forestry in the University of Toronto, delivered a brilliant address on Reforestation, in which he differed from the view expressed by the president as to Canada's forest wealth. Relatively, he said, Canada was a poorly-wooded country. It was claimed by some that eight hundred million acres, or over 37 per cent. of the land area, was under wood, but if they looked at that vast forest area from the manufacturers' point of view, from the standpoint of supplies for the yards and industries, and its commercial value, and studied the geography and nature of the country, they would come to the conclusion that three hundred million acres, and perhaps less, would cover fully the commercial value of the timber land area, actual and potential, and that was not more than half of the commercial forest area of the United States. He dwelt on the necessity of steps being taken to cope with the fire fiend.

Among other interesting suggestions by various speakers, W. H. Rowley, vice-pres. and manager of the E. B. Eddy Co., Hull, suggested that manufacturers should keep and exchange a register of employees who had left their employ or been discharged. They would thus be in a position to guard against restless and disturbing spirits.

Charles Reid, paper box manufacurer, Hamilton, stated that in the last ten years that industry had tripled its output. The development of lighter manufactures caused a great demand for paper boxes.

An influential deputation of pulp and paper manufacturers including Hon. J. D. Rolland, of Montreal; J. R. Booth, Ottawa; Carl Riordon, Toronto; W. H. Rowley, President of the E. B. Eddy Co.; F. C. Campbell, of the Canada Paper Co.; H. Beirmans, of the Belgo-Canadian Mfg. Co.; L. Armstrong, of Grand Mere, Que.; and Albert Maclaren, Buckingham, Que., waited on the Ottawa Government on the 9th inst., with a request for an export duty on pulpwood.

The plea on which the request was made was that the present exportation of pulp-wood to the United States is a large drain on our Canadian spruce forests, and that if an export duty were applied it would result in the American papermakers erecting mills in Canada for the manufacture of their pulp on this side, and, in time, no doubt, their paper, too. The Government's attention was called to the fact that United States paper mills will soon be dependent on Canada for their supplies of raw material, but that as matters stand the Americans are importing all they want of our pulpwood duty free, and at the same time maintaining a high protective duty against the product of the Canadian paper mills. The Premier promised careful consideration to the arguments advanced by the deputation, who will return to Ottawa shortly, with fuller figures bearing on the present situation in regard to pulpwood exports to the United States.

ALUMINIUM PAPER.

Several improvements have lately been introduced in the manufacture of aluminium papers. Metallic papers, or rather metallized papers, have hitherto competed, with great difficulty, with tin foil. Endeavors were first made to replace tin foil by aluminium prepared in the same way, but the latter has the inconvenience of being brittle and consequently little suitable for packing.

As an intermediary step and to avoid the difficulty mentioned, it was decided to manufacture metallized paper, i.e., paper coated on one side with metal. The first results, though interesting, were insufficient to assure success for the new product. The process employed was much too defective, though eminently adapted for packing, especially when brought into direct contact with food, owing to the absence of all trace of arsenic or poisonous metal. Thus it merely remained to improve the process of manufacture to obtain a metallized paper capable of meeting all requirements.

The French Aluminium Co. have conducted a number of experiments with most successful results. The old system is still in use, although the new process plays a preponderating role. Describing the initial process a writer in "La Nature" says the plant can be utilized both for ordinary and metallic papers of inferior quality. Two machines are employed. One of them receives the raw paper in rolls for preparation. It comprises a certain number of cylinders and a trough in which the color is mixed with gelatine or casein. To make metallized paper the liquid contains a certain amount of metallic dust in suspension which is deposited on the paper with the color. Brushes worked by the machine itself spread out the coat evenly. Then the paper continuing in motion is drawn towards the dryer. The latter has a double rolling track supported on pillars and constituted by two endless chains running across the building lengthwise four times. When the paper leaves the machine it is gripped, or rather supported by a stick, which automatically places itself on two spurs fixed at intervals on each of the chains. This stick moves forward with its load and another follows to take the paper at a suitable distance from the first. Thus the paper is carried by a large number of sticks which are drawn through the the dryer by chains at the required rate of speed. Finally, after travelling about 500 metres, the paper is collected by the reel and conveyed to the calenders, and if necessary goffered. However, this process which is excellent for manufacture of ordinary colored paper, only gave, in regard to the manufacture of metallized paper, results such that tin foil had nothing to fear.

With the introduction of the Wickel process, put into practice at the commencement of the year, great improvements have been effected. As previously any kind of paper is utilized, but with this difference, that extremely thin sheets like cigarette paper weighing only 10 grammes per square metre can now be utilized, as also paper weighing 300 grammes per square metre, which is the weight of that for post cards. Thin or thick, white or slightly tinted, the paper reaches the works in widths of 65 centimetres on reels. This width is not essential as the machines can treat paper one metre wide. First of all it is coated with a varnish of suitable rosins dissolved in a volatile liquid like ether or alcohol. This application which is made automatically—the workman having merely to attend to reeling—water-proofs the paper and prepares it for the metallic coat. This coat is given by a special machine of somewhat large dimensions, which constitutes the new process and alone executes all the operations.

The paper drawn by hot cylinders passes under a narrow trough equal in length to the width of the paper, and having a hopper as bottom which has a vibratory motion to deposit the metallic dust uniformly on the surface to be coated. The particles of metal incorporated with the rosin are thus protected against atmospheric agencies and themselves excellently protect the paper. Above the machine there is a large tube terminating with a nozzle like dust aspirators. This part in fact acts in the same way by sucking the waste metallic dust escaping from the sieve which is dusted with a brush. The dust is carefully collected for further use. The metallic coat has then its characteristic brilliancy and only requires calendering to give it a gloss. The product might be employed just as it is, but owing to the very varied needs of buyers, always exacting, it is goffered between two cylinders, one of which is engraved in steel whilst the other is compressed paper, thus it is stamped with an original and artistic design. The paper has then varied aspects as regards color and goffering which make it suitable for all kinds of purposes: chocolate, cigarettes, etc., bookbinding and even wall paper. The last-mentioned is very practical, as it can be washed with a sponge and withstands the effects of light humidity and grease. Moreover, it far excels ordinary paper from the decorative point of view, and though cost is a little greater this is compensated for by durability.

The new process has the advantage of being cheaper than the old one as regards raw material. According to the inventor, the amount of metal required to coat a given surface by the old system is five times greater than with the new machine. Paper of any thickness can be coated, and cotton cloth or silk can also be metallized with equal facility. Multi-colored paper may be produced by applying metal dust of different colors side by side. However, no attempt to do this has yet been made on an industrial scale.

Various samples of this paper were analysed by Dr. A. Riche, of the French Academy of Medicine. No trace of arsenic or poisonous metals could be found. Consequently aluminium is preferable to tin foil, it being found that air, water, wine, beer, cider, coffee, milk, oil, grease, have less action on aluminium than on lead. Aluminium, when employed for packing foods, is not brought into contact with them, as the metallized sides of the paper is on the outside of the packet.

OFFER FOR SALE OF DON PAPER MILLS.

The old historic Don Paper Mills, east of Toronto, were last month bought lantyne, of the law firm of Ritchie, Ludwig, and Ballantyne, presumably on behalf of Robert Davies, of the Don Brick Works. The bidding began at $10,000, and went up by bids of $1,000 till $17,000 was reached, after which the bids were for $100 each till the final $20,000 figure was offered. This was considered by the owners, but after a few days, rejected. The mills are in full working order, and the lands extend to about twenty-two acres, and are intersected by the Canadian Northern Railway Company's line to Parry Sound. The mills have been in operation for many years, the Taylor Bros. having established the first about 1840, shortly afterwards acquiring the adjacent Eastwood lumber mills. The original mills have disappeared, and only the old mill race and the site of the old pond can now be traced. A few years ago the northern of the three modern mills was destroyed by fire, and was not rebuilt, and the southerly one was absorbed by the Don Valley brick works. The remaining mill is still working at full pressure, and has been enlarged and improved to a considerable extent by the Taylor family, who have been in continuous possession, and who have practically never ceased to operate the works since they came into their possession over sixty years ago.

LOADING.

The methods for obtaining a maximum retention of the china clay or similar filler in paper are well-known to most paper makers, and experiments have no doubt been carried out in every mill to determine what quantity of clay should be put in the beating engine with the pulp to ensure a certain percentage of ash.

R. W. Sindall discusses in the "Paper Makers' Journal," the formulae bearing on this question.

Leaving out of consideration for the moment the questions of moisture in the paper, the atmospheric or hygrometric condition of the clay used compared with that of the ash obtained by the usual test for loading, and other matters which tend to complicate the problem, we may note that a close relation exists between:

(1) The weight of pulp put in the beater ......e.g., P cwt.
(2) The weight of clay added ....e.g., L cwt.
(3) The weight of finished paper ....e.g., W cwt.
(4) The percentage of ash in the paper ....e.g., a.

In studying these relations from the theoretical standpoint it is necessary to take several hypothetical cases.

(A) Assuming that all the pulp used and the clay added are found in the finished paper:

$$W=P+L.$$

With this assumption the weight of finished paper can be calculated from the figure P, the weight of pulp put in the beater, and the figure a determined by experiment as being the percentage of ash in the paper.

The formula is:—

$$W=\frac{100\ P}{100-a.}$$

which is readily obtained. Thus the actual weight of clay in the finished paper is W—P.

The weight of clay is also $\frac{Wa.}{100}$ It follows

$$W-P=\frac{Wa}{100} \text{ and therefore } W=\frac{100\ P}{100-a}$$

a formula which is correct within certain limitations, as, for example, those relating to the corrections necessary for the change in the china clay produced by igniting the paper in making the test for ash and so forth.

Example (1).—10 cwt. of pulp and 1 cwt. of the clay ore mixed. The ash in the paper is 9.1 per cent.

$$W=\frac{100\ P}{100-a}\ W=\frac{100\times 10}{100-9.1}=\frac{1,000}{90.9}$$

$$W=11 \text{ cwt.}$$

This is, of course, a hypothetical case pure and simple, since the figures tend to show that the whole of the pulp and clay are in the finished paper. The problem is much more complicated in reality.

Example (2).—20 cwt. of pulp and 2½ cwt. of clay are mixed. The ash of the paper as found by experiment is 8 per cent.

$$W=\frac{100\ P}{100-a}=\frac{100\times 20}{100-8}$$

$$W=\frac{2,000}{92}=21.73 \text{ cwt.}$$

In this case the weight of paper is 21.73 cwt. obtained as against the sum of the pulp and clay originally used, viz.: 20+2.5=22.5 cwt.

The second example introduces the subject of the relation of the clay retained by paper to the amount originally added to the pulp in the beating engine. It is, of course, well known that in the case of a pulp or of a mixture of pulps beaten for a particular paper, the amount of clay added per ton of pulp cannot be increased indefinitely. That is to say, the maximum percentage of clay retained in the paper for fibres beaten under specified conditions is independent of any excessive addition of clay, since it is impossible to increase the quantity retained by further additions of china clay beyond a certain limit. If 2 cwt. of clay added to 20 cwt. of pulp gives a paper carrying 8 per cent. of ash, and no greater quantity can be put into the paper by the addition of another ¼ cwt. of clay to the beater, it is evident that the maximum retention has been reached under such conditions.

Whether the manipulation of the staff can be altered so as to obtain a greater retention, a matter of some importance for papers whose chief merit seems to be in the absence of fibrous constituents, is a subject with which we are not concerned at the moment

So far we have merely considered the figures P.W.a., and the simple relations which exist between them under the conditions assumed. If we study further the question of the clay originally used and added to the pulp we shall find it possible to calculate the percentage of loading actually retained and to construct a simple table of reference accurate enough for practical comparisons. In example 2 it may be noted that the actual loss of weight, viz., 22.5—21.73 cwt. that is 0.77 cwt., presumably a loss of clay, indicates a retention of loading which is not very high. In practice the loss is obviously not such a simple one, since the small particles escaping from the machine do not consist entirely of clay.

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IMPERIAL PAPER MILL AFFAIRS.

The affairs of the Imperial Paper Mills Co., Sturgeon Falls, have been again in the High Court. Before Chief Justice Mulock there was heard another motion to change the receivers. The Chief Justice stated, when the case was called recently, that he had had an interview with E. R. C. Clarkson, who had given him to understand that there was nothing seriously to complain of as far as the conduct of Mr. Craig, the receiver, is concerned, and that he thought the appointment of Mr. Craig might be made indefinite until certain financial arrangments could be made. This was acted on. D. T. Symons, for the Quebec Bank, asked for leave to serve notice on the company for the winding-up of the company and also for leave to the bank to proceed upon their securities to obtain possession of the logs covered thereby against the company and the receivers. W. H. Blake, K.C., representing the trustees for the holders of the first issue debentures, asked the court to extend the enlargement, if one were granted, for a sufficient time to enable him and counsel for other parties to consider Mr. Clarkson's report. It was stated that negotiations were now under way in Montreal looking to putting the mills on a proper financial footing, and Chief Justice Mulock agreed that immediate financial relief or liquidation were apparently the only alternatives. John Moss, for certain bondholders, said that his clients were greatly surprised to find from Mr. Clarkson's report that the receivers had exceeded their authority in the matter of securing financial aid to carry on the business. Instead of the $60,000 allowed by the Court they had, he said, incurred liabilities aggregating $192,000. An order has been applied for directing the city receivers of the mills to realize on their assets and repay the loan advanced by J. J. Parmer last October. Mr. Clarkson has been appointed permanent receiver.

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—The employees belonging to several branches of the International Brotherhood of Bookbinders, in New York, Boston, and other cities, have struck work for the enforcement of the eight-hour day.

DYEING PAPER PULP.

The most rarely used dyes for special shades are:

Rhodamine (B, G, 6G),

Victoria blue (B, R, 4R),

Turquoise blue (B, G,R),

and a number of specialties of particular bright shades.

All the basic dyes mentioned above may be combined in any proportion for fancy shades and work well on almost any kind of pulp; they are well taken up by the fibre and allow of close matches being made; but in full heavy shades there is apt to be some color in the backwater unless a combination is made with an acid dye to fix the color better. (Examples will be given later).

The acid dyes in common use are:—

Azo yellow, metanil yellow, orange II, croceine orange, croceine scarlets, paper blue (water blue), nigrosine, naphthol black.

It will be noticed that these are also the same dyestuffs that are dyed on cotton with alum. They require alum as a mordant in pulp dyeing; other metallic salts fix them better by forming lakes, but either the cost or the bad effect on the paper hinders their more extended use, and where alum does not set the color sufficiently, a proper combination with the basic dye will usually do the work.

The direct dyes have not yet come into general use, with the exeception of a few yellows intended to supplant auramine and metanil yellow, the first because of its sensitiveness to heat, and the second because the acid of the alum often darkens it. There is no reason why a large number of direct dyes, which work cold, should not be used, providing their cost compared favorably with the other colors. They will probably be more largely used in the future, but at present have made little headway.

In matching a new sample there is more difficulty in getting the proper shade than in making several beaters of pulp match each other. In the latter case it is only necessary to compare small squeezed-out samples of the wet stock; but for a new sample the best way is to split the sample so as not to be misled by the glaze or calendered surface, then dry a small sample from the beater on a steam pipe and when it is dry split it also and compare it with the sample. Too much brightness of color is best remedied by the use of darker pulp; but if this is not convenient, it is better to use a small amount of the complementary color rather than to use black for dulling the tone.

The complementary colors are:—

Violet and yellow, blue and orange, red and green.

Either member of these pairs will kill the tone of the other and make a shade approaching black or neutral tint.

A few examples of standard shades good for any mixture of pulp will illustrate the principles before mentioned, and will serve, with slight changes, in making the general run of colors. All proportions being for 1,000 pounds sized pulp.

Bright red—15 pounds croceine scarlet, 15 pounds alum; when well beaten into pulp add 3 pounds fuchsine, 3 pounds chrysoidine.

This gives a fairly clean backwater.

Bright green—10 pounds metanil yellow, 10 pounds alum; later add 5 pounds malachite green crystals.

Bright blue—5 pounds paper blue (greenish shade), 5 pounds alum; later add 5 pounds methylene blue (blue shade).

Pink—One-half ounce safranine.

Baby blue—One-half ounce methylene blue OO.

Dull blue—6 ounces malachite green, 6 ounces methyl violet 2B.

Buff—1½ pounds orange II, 2 pounds alum; later, 1½ pounds auramine O

Gray—1½ ounces methyl violet, 1½ ounces malachite green, 3 ounces Bismarck brown.

(These figures will need changing, according to the strength of dyes used).

Gray No. 2—8 ounces nigrosine (jet shade), 8 ounces alum.

Apple green—10 ounces malachite green, 8 ounces chrysoidine.

Light orange brown—4 ounces Bismarck brown.

Bottle green—9 ounces paper blue, 9 ounces alum; later, 1½ pounds malachite green, 2 pounds chrysoidine.

(A darker shade may be made by using Bismarck brown in place of chrysoidine).

Chocolate—7½ pounds Bismarck brown, 12 ounces malachite green, 8 ounces methyl violet.

Garnet—5 pounds fuchsine, 1 pound Bismarck brown.

Burnt orange—10 pounds chrysoidine.

Olive green—3 pounds malachite green, 4 ounces Bismarck brown.

Lemon—3 pounds auramine O.

Straw—4 ounces auramine O, 4 ounces chrysoidine.

These examples give only an idea of the colors used most commonly for such shades. On account of the great difference in strength and shade of the dyes on the market, it would be impossible to give the recipes for pale fancy shades; but these can all be made from malachite green, methyl violet, chrysoidine, auramine, Bismarck brown and fuchsine in proper combination. If the shades are heavy, a bottom color of an azo dye and alum may be used afterward shaded by basic dyes. The only rule in matching shades is to learn by practice; it cannot be taught. The operator should be familiar with the shades made by the straight dyes and then use his judgment as to how much must be used to make the effect he desires. Allow the color to be well mixed with the pulp before sampling and remember that the outside of the dried sample has twice as much color as the inside. Paper calendered dry has less color than when calendered damp, and sizing also gives a heightened color. By heeding these facts, the coloring of pulp to shade will soon be an easy matter.—"Textile Colorist."

THE SITUATION IN NORWAY.

Farmand of a recent date said: We don't think that paper-makers abroad can yet have fully realized how extremely serious the situation really is with regard to the supply of mechanical wood pulp for the next few months.

The Norwegian mills have never before in one year had so large production as they will reach during 1907. In the first instance, several of them have recently been rebuilt, and in many better turbines have been laid in and other improvements have from time to time been effected. And during the whole of this year water conditions have beeen better than they have been for years—in fact, the trouble has sometimes been a superfluity instead of scarcity of water. Finally, prices have been rising, and, as a natural result, every effort has been made to reach the maximum of output. But in spite of all these favorable circumstances the mills have been cleared out week after week, no stocks have accumulated, and the difficulty has rather been to complete shipments as rapidly as customers have demanded.

Since March prices have been constantly rising, most rapidly during the summer months; the mills, have, therefore, been in a position constantly to fill their order books so long as there was anything left for selling. When a mill has sold all it can possibly hope to produce until the end of the year it must perforce refuse further orders, no matter how tempting the price may be.

It is all very well for people to call Kr. 50 per ton a positively wicked price. But for the 3,000 to 4,000 tons for delivery 1907 that are at this moment for sale, Kr. 56 is asked for ordinary brands, stave packed, and nobody can tell what the last of these few tons may fetch when paper-makers generally have found out that they must either pay any price or temporarily stop some of their machines for want of stuff to put into their beaters.

We agree that it would be the best, both for sellers and buyers, if the price for next year did not go much beyond Kr. 40 or 41 f.o.b. But prices have a knack of ignoring the wishes and opinions of the most benevolent outsiders. The Norwegian mills have sold at steadily rising prices more than half of the quantity which they can on a liberal calculation turn out during 1908, and now Kr. 43 to 45 is the market price. In the same connection it may be of interest to add that the Scandinavian mills as a whole are believed to have sold three-fourths of their production.

That the consumption of wood pulp has greatly increased is evident. High prices will of course tend to an increase also of the supply. But the production of mechanical pulp cannot be increased ad libitum just as that of chemical pulp, because it is dependent upon waterfalls for motive power, and these falls must be situated in districts where logs are obtainable without unduly raising the price. There are still a few such waterfalls in Norway which may be utilized. We do not know how many similar falls are available in Sweden, but we should imagine that in this country also the best situated falls have already been occupied.

A constantly increasing consumption of mechanical wood pulp will therefore not easily be satisfied. As for Canada, it seems that the paper-makers in the States can use all that Canada has to spare, if not more, and no doubt the paper consumption in the States is increasing at least as rapidly as in Europe, so any great relief for the European paper-makers from that quarter during the coming period of scarcity is hardly to be expected, at least not in the immediate future.

PULP AND PAPER HANDBOOK.

The Montreal Gazette, commenting on the data collected by the Pulp and Paper Handbook, just issued by Biggar-Wilson, Ltd., Toronto, remarks:—" When pulp and paper are referred to, the Province of Quebec is unmistakably the leader. The volume gives the capacity per 24 hours of the mills in the different Provinces as follows:—

	Pulp. Tons.	Paper. Tons
Nova Scotia..........	179	11
New Brunswick	210	5
Ontario	607	346
Quebec	1,361	584

Thus Quebec's proportion of the production of the Dominion is in the case of pulp 58 per cent. of the total, and of paper nearly 62 per cent. There are other industries in which the Province can make as good a showing

* * *

Result is to hand of enquiry made by engineers into the problem of how to maintain a regular supply of power on the Chaudiere during the winter. Mr. Murphy, one of those who conducted the investigation remarks that it has been believed in northern latitudes that the operation or stoppage of hydraulic power plants was determined by the absence or presence of frazil or anchor ice, and he once gave the advice that an auxiliary steam station of as great capacity as the hydraulic plant was necessary to obtain uninterrupted service where the ice nuisance appeared. He now retracts and says that frazil need not be allowed to tie up a hydraulic plant if a manufacturer resorts to the simple remedy of applying a moderate amount of heat to the vulnerable parts of the equipment. The usual effect of frazil on hydraulic power plants is to block up the racks, hinder the gate mechanism and reduce the output of the water wheels, if not shutting them down altogether.

HAND-MADE AND MACHINE-MADE PAPER.

The points of difference between hand-made and machine-made paper are gone into at some length by T. Hadfield, in Paper and Pulp.

Hand-made paper making is a slow and tactful process. Linen and the best cotton rags are generally used for the best hand-mades, but in some cases a small percentage of wood may be added, in order to make extra profit.

The rags, having gone through the preliminary process of dusting, cutting, and boiling, are taken to the breaking engine to be washed, bleached, and prepared into half-stuff. The bleaching liquor is not added until the rags are free from dirt. Due care is taken not to cut and mince the fibres, but they are carefully drawn out; and it is the careful attention in the breaking and beating that is the making of an ideal hand-made paper.

The pulp when ready is run into the vat, which is generally made of wood or stone, and is fitted with a steam-pipe, in order that the pulp and water may be of a uniform temperature, and an agitator to keep the pulp equally mixed. The moulds used vary in size according to the size of the sheets to be made. They are fitted with a wire, and the deckle can be divided by pieces of wood, so that several small sheets of paper can be made in one mould. The vatman dips the mould into the vat, and brings up sufficient pulp to form a sheet of paper of the necessary weight. The vatman is so accustomed to this delicate operation that the weight of each sheet seldom varies; but many sheets are not perfect, owing to one side being thicker than the other, and generally a high percentage are of this nature, and have to be sold a little cheaper. The vatman shakes the mould alternately in four directions, so that the pulp is well felted and interwover

It is here that the particular difference is noted between hand-made and machine-made. It will be noticed by practical men that the majority of the fibres are full length across the sheet; in machine-made the fibres mostly run, and are fixed in the length of the sheet. This difference is best noticed in mottled papers. The coucher removes the sheets from the moulds, and places them between pieces of woollen felt. Both sides of the sheet are covered, and are piled up to a certain height, and then subjected to a very heavy pressure. On the outside of the press the sheets are separated from the felts. The sheets are then placed in the press again for the night. This process gives a surface to the paper, removes felt marks, and more moisture is got rid of. Where surface is most important they are pressed several times. The sheets are now loft-dried on ropes of cow-hair—a kind of rope that does not stain the paper. The sheets are then sized with gelatine; after sizing they are dried, pressed, sorted, and finished into reams Rosin size is very seldom used, as it requires a certain temperature to fuse it. All the processes in the making of hand-made paper are of a careful, slow, and laborious nature; at one time the wires in connection with the mould were not interwoven, but wove wires are now used: so that extra fine pulp may be utilized.

Hand-made paper generally shrinks in the drying from ½ to 1 inch per foot; extra good material is used in its manufacture, and it is generally sized with gelatine. The paper is equally strong in all directions, and when torn in any direction the edges are exceedingly fibrous. Its deckle edges are never cut; and the impression left by the wire-cloth is most difficult to recognize. Hand-made paper is 5 to 10 per cent. stronger across than in its length.

In machine-made paper the majority of the fibres are fixed lengthwise in the sheet. The direction of the shake is all one way (side to side). A machine-made paper is stronger in the direction of its length by 20 to 25 per cent.; and it does not contract or shrink to the same extent as hand-made. The uniformity is far more perfect; but it tears easily, and the edge is much straighter and less fibrous. The impression of the wire is more clear, and it is also finer. There are, undoubtedly, various specimens of machine-made passed as hand-made, and the difference can only be diagnosed by a non-practical man in the case of a mottled paper, the majority of the fibres being fixed in the paper the narrow way.

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PHILLIPS' PAPER TRADE DIRECTORY OF THE WORLD.*

"Phillips' Paper Trade Directory of the World," with which are incorporated "Phillips' Directory of Paper-Makers of Great Britain and Ireland," and "Phillips' Paper Trade Directory of the British Empire," for 1906-07 is now issued. This valuable book, covering nearly 800 pages, and neatly bound in a specially blocked strong cover, represents many years' concentrated labor on the part of S. Charles Phillips, Editor and Proprietor of The Paper-Maker. As regards size, the issue now before us is virtually double that of 1906.

The aim of the editor has avowedly been to make "Phillips' Paper Trade Directory of the World" a standard work. We may summarise the main features of the directory thus:—

The Paper Mills of the World, given in alphabetical and numerical order, and also arranged under the respective countries in which they are situate, together with a classfication of the various makes of paper.

The Wood Pulp Mills of the World—Mechanical, cellulose, sulphite, sulphate, soda, etc. Also lists of

Buyers of Paper, Boards and Stationery in the world, as far as obtainable; of

Millboard Makers, Enamellers, Paper Stainers, Paper Agents, Export Paper Shippers, Paper Stock Merchants, Wholesale Stationers, and Paper Box and Bag Makers.

Registered Water-Marks of the various mills and stationers.

To this must be added the members of the Paper-Makers' Association of Great Britain and Ireland, and the Scottish Paper-Makers' Association, and the various associations connected with the kindred trades.

* * *

"THE HEAVIEST AND LONGEST BELT IN CANADA."

The West Canada Cement & Coal Co. have the honor of purchasing the above belt for power purposes for their new plant. The weight was 2,480 pounds, and the manufacturers report it to be the longest ever made (800 feet), but not the widest, as they made one 60 inches wide for the well-known Textile Company, "Crossleys," of England. This belting is the world renowned "Camel Brand," and the sole manuturers (F. Reddaway & Company, Montreal) shipped some 1,500 feet to the Montreal Cotton Company for use in their dye house and bleachery, where they adopted it many years ago, and have used it ever since as it withstands effects of damp and chemical fumes.

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—The Norwegian Parliament has passed legislation providing that in granting concessions for the utilization of watercourses, the King may impose any conditions that may be advisable in the public interest.

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* Phillips' Paper Trade Directory of the World. Edited and compiled by S. C. Phillips. Copyright. Demy 8vo., cloth boards, gilt, price 10s. 6d., post free to any part of the world. Offices of The Paper-Maker, 47 Cannon Street, London, E.C.

A BOSTON VIEW OF RESTRICTED PULP EXPORTATION.

This is the way the Boston Transcript looks on the question of a restriction of Canadian exportation of pulp. It is taken from an article appearing in that journal on the industrial plants owned in Canada by American capitalists:—

The American paper-making industry is not represented among these international plants. But American paper-making companies, especially those using wood pulp, may have to join the procession across the boundary line if they desire to hold their over-sea trade —to retain the business which they now hold in Great Britain, in South Africa, and in Australasia. It is not improbable that they will be impelled northwards somewhat in the same way as the Michigan lumbermen were compelled to set up sawmills and other wood-working factories in Ontario. In December, 1905, when the Tariff Commission was at Three Rivers, Que., a strong appeal was made by the Canadian paper-makers using wood pulp for an export duty on pulp-wood. It was urged on the ground that such a duty would enable Canadian mills to get a larger share of the trade in news-printing paper in Great Britain and in Australasia and South Africa. It was complained that American mills undersold Canadian mills in these British markets; and it was insisted that this underselling would be rendered impossible if American mills were compelled to pay an export duty on the pulp-wood supplies which they are drawing in increasingly large quantities from Ontario, Quebec, and New Brunswick. At the city of Quebec, however, the representatives of the farmers who appeared before the Tariff Commission were most hostile to the proposed export duty. They urged that it would throw them into the hands of the local paper mill companies, who would then be able to pay what they pleased for wood pulp.

No export duty was imposed when the tariff was revised in the Winter of 1906-7. But since July there has been a well organized, sudden and unexpected recrudescence of the agitation by the paper mill companies. It has been renewed wth much vigor; and also under circumstances which give it quite new significance. Sir William Van Horne, president of the Laurentide Paper Mill Company, whose mills are at Grand Mere, Que., has made a strong appeal for an export duty. Great prominence has been given to this appeal in the leading organ of the Laurier Government at Toronto and also to the appeals of other prominent Canadian capitalists interested in paper making; and there are many things more improbable at Ottawa than the imposition of a stiff export duty on pulp-wood before the present parliament comes to the end of its term.

American paper companies, which are now using pulp-wood at the rate of four million cords a year, and importing spruce wood from Canada without paying any United States import duties, at the rate of 700,000 or 800,000 cords a year, would be at a serious disadvantage in regard to their American business if they established mills in Ontario and Quebec; and no American company as yet does any trade in pulp-wood paper in Canada. The American import duties on pulp paper range from three-tenths of a cent per pound on paper valued at not more than three cents a pound to fifteen per cent. ad valorem on paper valued at over five cents a pound. There is moreover, a clause in the Dingley Act which provides that if any country or dependency—which means Canada—shall impose an export duty on pulp-wood exported to the United States " there shall be imposed on printing paper when imported from such country or dependency an additional duty of one-tenth of a cent per pound for each dollar of export duty per cord so imposed and proportionately for fractions of a dollar of such export duty." Under this tariff American paper companies establishing branch mills in Canada would be enormously hampered if they sought to supply their American demand from mills in Quebec or Ontario. But if the Dominion Parliament should impose a heavy export duty on pulpwood, they would almost be compelled to manufacture in Canada if they desired to hold the trade which they have in England, in Australia, and in South Africa.

EXTRACTION OF CELLULOSE FROM STRAW AND HEMP WASTE.

The process at present in current use for extracting cellulose from straw and the refuse from hemp, supplied by the ropemakers, consists in boiling them in soda lyes of various kinds, sometimes caustic soda, sometimes sulphide or sulphite of soda. The practical difficulties in connection with these treatments are, however, considerable. For one thing, the lyes are not exactly cheap, and their recuperation after use is troublesome, and forms a serious deduction from the gain secured by employing them again. The net result so far, is that the cellulose we are now speaking about has not been able to compete with cellulose from wood, in spite of the fact that the cellulose from straw, hemp, etc., is far better adapted for paper making than wood pulp.

As was natural, the first attempts made to extract the cellulose from these non-coniferous fibres took the form of ordinary sulphite working, and they were accordingly boiled with bisulphite of calcium. Nevertheless, the silica in the stems, the stiffening and hardening ingredient of the cuticular fibre, necessary to enable the stalk to resist the wind, is insoluble in the bisulphite, so that it remains mixed with the fibre, and renders all bleaching impossible. A French gentleman, Monsieur E. Nemethy, has recently hit upon an idea for avoiding all these difficulties. He finds that if the bisulphite used on straw, hemp, etc., is bisulphite of magnesium instead of calcium, that the result is a pulp usable without further preamble for paper making.

The inventor had to meet, as is usual with inventors, difficulties quite different from those he was trying to surmount. To obtain the bisulphite of magnesium, the base, which is the natural magnesium carbonate, must be calcined, whereby the carbon dioxide of it is driven off and a caustic and hard, yet very friable residue is obtained.

Here we have the first difficulty. The friable nature of the magnesia prevents it from being used by itself in the sulphiting towers as lime is. At the same time its hardness makes its conversion into bisulphite difficult. In the new process under notice, the calcined magnesia is sorted, and the hard lumps are placed in wire baskets through which the bisulphite solution is made to pass after having dissolved the powdered magnesia. The hard lumps are formed in the calcination of the carbonate and resist the lye. If they were piled up in the tower, they would choke it. If the stuff is sorted, as above stated, the same lye may be used throughout, acting first on the small stuff and then on the hard lumps.—Bulletin Journal des Fabricants de Papier.

* * *

—At a banquet given in their honor, by the Sault Ste Marie Council, and Board of Trade, a number of visiting British journalists heard and began to realize many things about Canada which will serve to enhance in their minds its reputation as a field for investment. Hon. Frank Cochrane, Minister of Lands, in an after-dinner speech, outlined the pulpwood policy of the Government. He said there was still enough pulp-wood on the lands reserved by the Government to keep 200 mills, of the capacity of the one in the "Soo," in continuous operation for fifty years.

AMERICAN PULP-WOOD BUYERS IN CANADA.

The famine in pulp-wood grows ever more acute. Representatives of pulp and paper mills in Wisconsin, Michigan, and Pennsylvania are in active competition for pulp-wood in the territory tapped by the Temiskaming and Northern Ontario Railway. They are buying all they can get for delivery this season, and in some cases making contracts for supplies for several seasons ahead. Wisconsin parties who own pulp-wood limits on the Quebec side of Lake Temiskaming are planning to cut their timber this winter in sixteen foot lengths, raft it down the lake in the spring to Haileybury where the T.&N.O. is building a spur line to the wharf, rail it thence to North Bay, where it would be dumped into Lake Nipissing to be again rafted, this time to the Georgian Bay, thence loaded into the company's barges for conveyance to Wisconsin. Parties buying pulp-wood on the Ontario side of the border are urging the Temiskaming & Northern Ontario Railway Commission to build spur lines to Long Lake, on the Charlton branch of the line, and to other points where quantities of pulp-wood are being cut. It is scarcely likely that this will be granted for some time to come.

DURABILITY OF PAPER.

Some very useful data as to the durability of paper of various compositions, especially as to the effect of the heavy filling which has come so much into vogue of late years, have been obtained at the Testing Institute at Gross Lichterfield, Berlin.

In the pioneer investigations 641 different specimens of papers have been tested as to their durability in storing over a period of about twelve years. They were the product of five different mills, and were of thirteen different designations.

The 641 specimens were divided into three classes:—

Class I.—Pure rag papers	162
Class II.—Rag papers containing at most 25 per cent. of wood cellulose, and giving 5 per cent. of ash	224
Class III.—Any composition, except that mechanical pulp must be absent, and that the ash must not exceed 15 per cent...............	255
	641

The test was carried out in the following manner:—Bundles were made, each of one sort of paper, and they were tied up loosely with string, without any wrapping, and shelved for the first year in cupboards in the working-rooms of the Institute; and then for a time in the loft, and for a time in the cellar, so that they were exposed to all the various, atmospherical conditions to which paper is required to be resistant. It is evident that paper is never intended to be exposed to the weather out of doors.

The general results may be summed up as follows:—Exposure to the air lessens the strength of the paper; but with the papers under examination the difference in the various samples was not remarkable, and no distinct superiority on the part of pure rag-papers could be established. It is true that the time over which the tests extended is insufficient to enable any judgment to be formed as to the relative merits of different papers intended for use for important documents, which cannot be perpetuated like books, inasmuch as the original is the important document. They show fairly well, however, that the addition of reasonable amounts of wood pulp does not materially affect the durability of a rag-paper.

It is unfortunate that these tests have been undertaken so recently and so imperfectly. The great question of the present day is the effect as regards durability, not of the admixture of different celluloses in the paper-pulp, but of heavily sizing, China clay, etc., and also of pigments. Nothing has as yet been done in this direction, and it is evident that, as the tests must be extended over many years, the sooner they are begun the better. Nevertheless, although the practice of printing on the heavy-sized and colored papers which are now in use, especially in the case of periodical and fictional literature, is of quite recent origin, enough empirical data are already at hand to create serious doubts as to whether such paper will not rot in a comparatively small number of years.

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NEW PROCESS FOR MAKING CHLORIDE OF LIME.

Attention is drawn by Moniteur de la Papeterie Francaise to the fact that chloride of lime in its usual form has not more than 40 per cent. of active chlorine, the remaining 60 per cent. being so much worthless dead weight. Efforts to remedy these conditions have failed, it is stated, owing to the inability of dry lime to absorb more than the above named proportion of chlorine.

By a German process described in the journal mentioned, insead of taking dry lime as the initial point the operation is conducted upon milk of lime, into which chlorine is introduced during constant stirring until the lime is almost saturated. The solution of chloride of lime thus obtained is filtered, and then evaporated in such a way that the decomposition of the hypochlorites is as much as possible restricted. The hypochlorite of calcium is then precipitated in crystallized form and can be easily separated from the chloride of calcium in solution by aspiration of the liquid and by washing.

Kingzett, Winteler and other scientists had long been experimenting on this subject, and though the former had produced crystals with 47 per cent. of active chlorine, he was apparently unable to devise a practicable industrial process in that connection. The present invention is based, however, on the plan of rendering stable the crystals obtained through evaporation by getting rid of all their moisture and of the bulk of their water of crystallization. This is effected (after their separation from the original water and after suitable washing) by drying—effected rapidly or at a low temperature, preferably by vacuum drying.

For the product thus obtained the inventor claims that it keeps better than chloride of lime prepared in the usual manner, presenting the following advantages: First, with hydrochloric acid 80-90 per cent. of its weight can be developed in active chlorine; second, it dissolves in water without cooling it and with almost complete limpidity. There is consequently no need of special clarifying apparatus at the place where it is used, there being moreover no disagreeable residue; third, when exposed to the air it does not become charged with moisture and does not become viscous, like ordinary chloride of lime, as it contains only a very small amount of chloride of calcium; fourth, the product is remarkably pure, uniform and easy to manipulate; fifth, its bleaching action is excellent, for as desired it can be made to yield free chlorine, free hypochlorous acid or oxygen.

Besides these technical advantages there is a saving in carriage, packing and storage, all of which are factors of importance as to export trade.

It is further remarked that instead of chlorated milk of lime the same chemical result would be arrived at with ordinary chloride of lime dissolved in water.

American imports of chloride of lime are about 110,000,000 pounds a year, of the value of about $900,000. The principal sources are England and Germany, the former supplying about 80 per cent. of the total.

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—As a result of the decrease in postage rates on British periodicals coming into Canada, the increase in the mails from that source has been phenomenal. The growth in the months of July and August was 162 per cent. compared with the same months last year.

THE MARKETS.

Toronto, Oct. 14, 1907.

Pulp.—The rains of the last month have improved the situation for grinding quite materially, though the low water in some parts is causing difficulty in bringing down logs. The mills on the Chaudiere have been busy. Reports which come to hand from the pulp cutting districts speak of increasing difficulty in getting good cutters, and wages, owing to the demand for G.T.P and other railway construction work, are very high, and likely to advance. The high price for all sorts of shanty provisions also is likely to have continued effect on the price of pulp. Pulp-wood is selling at $4 per cord on railroad tract in Temiskaming. Regular deliveries, the first since the Scandinavian lock-out, are now reaching England from Norway and Sweden, and this should tend to relieve the situation, but stocks are low in all parts. Ground wood is still more expensive in Europe than the Canadian article, so that there is no great chance of seeing a reduction of values in this country for some time, though the situation is distinctly easier. Canadian ground wood is worth $20 to $22 at mill. Sulphite is $2.15 to $2.30, delivered at mills this side.

Paper.—The shortage in supplies of news is causing some anxiety to publishers of newspapers, and more particularly to those of the United States, who are alarmed at the constant increases in price. For roll news they have to pay $2.65, while in Canada it is $2.50. These prices are held very firmly, with a brisk demand. Writings and wrappings hold the strong position which has been theirs for some months past, with a continued upward tendency, though quotations are about the same as a month ago.

Great Britain.—In both mechanical and wood pulp business is a little restricted owing to the prevailing higher prices, but as paper-makers' stocks are becoming depleted, they are becoming more anxious to buy. In chemicals fair business is being transacted, says "World's Paper Trade Review," and values are well maintained. Ammonia alkali, 58 per cent., is quoted at £4 10s. to £4 15s.; bleaching powder, soft wood, £4 10s. to £4 15s. on rails at works; caustic soda, 77 per cent., £10 10s.; soda crystals, £3 to £3 2s. 6d., f.o.b. Tyne; salt cake, £2; recovered sulphur, £5.

PAPER STOCK MARKET REPORTS.

Montreal, Oct. 12, 1907.

There is a fair demand for most lines of paper stock. The shortage and other factors have increased the demand for waste papers of all kinds, and some shipments of these are coming across from Europe. Considerable shipments of satinet for roofing felt stock are also coming over, but the demand for these is not as active as it was. The scarcity of money is affecting some of the smaller packers.

Quotations are as follows:—

Unbleached cuttings	4.50	to	5.00
White shoe clips	4.50	to	5.00
Colored shoe clips	3.00	to	3.25
Domestic white rags	2.25	to	2.50
Blues and thirds	1.25	to	1.50
Roofing stock	.90	to	1.00
Manilla rope	2.50	to	2.75
Waste papers	.90	to	.45
Bagging	.90	to	.—

* * *

—The new commercial treaty between Canada and France, just arranged by Hon. W. S. Fielding, is likely to lead to an increased exportation of pulp from this country to France, certain farm and forest products having been placed on the minimum list.

TROUBLES WITH CALENDERED PAPER.

A class of paper that both printer and binder have considerable trouble with is a highly calendered paper, especially if it is made in large size sheets and at a low price with a short fibre, says "Progressive Printer." This will frequently come from the paper mill to the pressroom with short tears on the edges extending from one-eighth to three-eighths of an inch, with each successive handling, such as taking out of cases, or untying bundles, piling on feedboard, then on hand truck to deliver to bindery, if bound in the same establishment, or, if sent to binder not on the premises, with the additional tying up in bundles and its final delivery on the feedboard of the folding machine. An edition of 1,000 was printed by a well-known and careful printer in New York on this kind of paper. The sheetman in the bindery where the sheets were delivered found, on opening the bundles, that 30 per cent., of 300 sheets, had tears in them just far enough to show after the book was trimmed to its proper size.

Another cause of complaint on the part of the binder is in the trimming of some grades of calendered paper. Two jobs, printed to all appearances on similar paper, but coming from different publishers, were cut alternately with the same grade of knife in the trimmer; in cutting one make of paper it was not necessary to change knives for four or five hours before regrinding, while on the other make of paper forty-five minutes or one hour was as long as the knives would do satisfactory work before needing regrinding.

Another grade of very thin paper stock, say, 32 x 44-65, is a source of a great deal of worry to both printer and binder, although the stock may be well made at the paper mill. With this stock, on account of the small degree of opaqueness that can be obtained none but the best grade of press work will accomplish satisfactory results.

One other serious trouble in some of this paper is the number of ragged holes in the paper, caused, probably, at the paper mill in consequence of allowing dirt or other foreign matter to accumulate on the wire screen.

When such a sheet is allowed to go to the printer we have the following result: The impression of the printing plate will be made on the tympan in that part where a hole may be in paper, and the next four or five sheets will have a blurred offset. If these defects are discovered in passing through the bindery it is not very serious, but when a book is bound and delivered to the customer, it becomes a serious matter, as it will inevitably be returned; the upshot being the necessity of sending a new book and paying carriage both ways.

The question arises, How can we collect the charges for the foregoing? The paper-maker may say: "You should see this in the pressroom, and throw out the paper, and we will allow you for same." The printer's answer will be: "If you are familiar with a modern pressroom, you will know that all sheets are fed into the printing-press by an automatic feeder, and, however well it may do its work, it has not eyes to see; and, although the sheet may be fed manually, the feeder has his eyes on his guides, and will be likely to let the sheet pass through the press without discovery." Or, he may answer, that the binder should discover imperfections; and his answer in turn will be: "You should be aware of the fact that we also use automatic feeders; and, though we did not, and fed all sheets manually, why should we discover these imperfections after a sheet has printed matter over its entire surface, and more difficult to discover such imperfections? Why do you not discover it when the entire surface is white and more discernible to the eye?"

To sum up the matter from a common-sense standpoint, we may say that none of us in the allied crafts are paid for more than we agree to do in our branch of the work. If we discover any imperfect work done by our predecessor, we will gladly throw it out; but we are not paid to look for it, and will in no way allow ourselves to be held accountable for it.

RUBBER ROLLS.

The rubber used in the paper industry mostly comes from Africa or South America, says G. Becker in a German exchange. It is first cut in pieces, washed and freed from impurities, sand, etc., and is, after having been dried, passed through calenders with heated rolls. The mineral materials that are used to vulcanize the rubber are strewn in a very finely powdered shape on the rubber, while it is passing through the calender, and is there mixed into it. The rubber is cut many times, rolled together, and again passed through the calender to obtain a thorough mixing, which is regarded as completed when the rubber is homogeneous without any grit.

The rubber has still about the same qualities as when it was raw. It has not yet any elasticity. It freezes when exposed to cold and softens in heat. The adhesion is very high under low pressure. It is, therefore, necessary to subject the material to a further treatment, and we come now to the manufacturing, properly spoken.

The manufacturing of rubber coatings for rolls requires an especially long experience, and forms quite a specialty in the rubber industry. The rubber mixture, made as described, is now again passed through a calender with hollow and steam heated rolls. The rubber leaves the calender in the form of sheets of even width and thickness, which are cut in suitable sizes for the coating. The iron body of the roll to be coated has in the meantime been cleaned and its surface has been roughened. It is now painted over with a strongly adhesive rubber solution, and the rubber sheets rolled on to the surface. The layers, first rolled, consist of a special mixture, so-called "hard rubber," which effects a reliable and resisting connection between the iron surface and the coating of softer rubber and acts as a kind of foundation for the whole rubber coating. The coating is continued with the soft rubber sheet. When this hard rubber coating has become thick enough, the rolling is done by hand, and the very greatest care must be taken, so that no air is left between the different rubber layers. If this should be the case, the air would form as big bubbles in the ready rubber coating, and consequently make its use impossible. It is of importance that the workpeople in the rubber factory are informed regarding the direction in which the roll is to rotate in the mill; the way of running of the roll should therefore always be indicated by an arrow. It is true that such information is impossible to give for all rolls, as some rolls often must be used for turning both to the left and the right.

If the coating now has reached the desired thickness in the way described, the real work of coating may be regarded as finished. The ready roll with the still soft coating is now enveloped in many layers of cloth, partly to protect the still soft rubber mixture against the direct influence of the steam during the vulcanization process and partly to keep the rolled layers of rubber closely together and effect a close combination between them.

The roll, coated with rubber and covered in the way described, is now put on a small truck and transported to the vulcanizing vessel, where it is left for several hours, exposed to direct steam pressure. The length of time it is left here depends upon the degree of hardness desired, and a very sharp control of the steam pressure must be established.

The free sulphur, mixed into the rubber, melts on account of the heat from the steam during the vulcanization process, and the rubber coating, which before was soft, hardens and acquires the elasticity and resistance required for the roll. The hard rubber, which serves as foundation, becomes hard as horn and makes a close connection between the soft rubber coating and the iron roll.

The cloth wrapped around the roll is taken away when the roll leaves the vulcanizing pan, and the roll is then ready to be turned even and polished.

The grinding of the roll is very important. The rolls are usually first ground straight in a lathe and then made somewhat thicker in the middle, in order to obtain an exact and even contact between the upper and lower rolls. One can, however, on a grinding machine of American system grind the rolls exactly and somewhat tapering from the middle toward the ends, either according to the working pressure given or according to the tapering wanted. The purchaser very seldom is capable of determining the right tapering, which depends both on the quality of the upper roll and on the working pressure. In this case it is recommended that the final adjustment of the two rolls be made when they are put in place in the press.

When a new or newly repaired upper roll is put into the press, if it is not strongly and evenly pressed on both sides and if the paper does not seem to be enough or evenly freed from water which is shown by spots on the driers and calender rolls, which ought always to be absolutely polished, it is necessary to investigate the presses during a shut-down in the following way, and, if found necessary, to use the roll grinding apparatus. Only a few minutes are required to fix up this device.

The sprinkler pipe is arranged on the entrance side of the rolls, after the felt has been taken away, and the press is subjected to the usual pressure and started. Those places of the rubber roll which do not quite come in contact with the surface of the other roll permit some water to pass through the rolls, while the rubber roll is dry on the places where there has been a complete contact with the upper roll. The roll grinding apparatus is now started on the dry parts of the rubber roll, and the grinding is continued until no water is passed through along the whole width of the roll.

If the presses have been ground together once in this way it is afterward only necessary to use the grinding apparatus to grind both ends of the rubber roll, to get them even after the wear and tear of the paper sheet, which is never as wide. This grinding usually requires only a short time.

If the rolls now are exactly pressed together, the felt will show nearly a straight seam The felt-conducting rolls must be looked over to see that the felt runs straight and with open, i.e., square, meshes.

It is evident that it is advantageous to grind both rolls together in the press, and already more than 300 of these devices are used in paper mills and are giving satisfaction.

The rubber manufacturer is saved from many undeserved claims, when this grinding apparatus is used, as a small fault in the tapering, caused either by the working pressure on the bearing not being correctly given or by the pressing device not working evenly, easily can be remedied.

Many well-known concerns in the paper machine industry always deliver a roll grinding apparatus with the paper machines, and the men sent to build the machine have orders to grind the rubber rolls light-tight with this grinding apparatus before starting the machine.

The construction of the iron body of the rolls is of great importance for the rubber manufacturer. He must know the construction of the roll, so as to be able to make the coating in the best way, as this is the only way for him to be able to guarantee the coating. Hollow rolls with the wall thickness as even as possible and with hollow end shafts are most likely to give good results. If both shafts are solid, then both heads should have holes of about ½ inch diameter, in order that the steam can enter into the interior of the roll, as the heat must act from the inside for the vulcanization of the rubber, in order to obtain the indispensible even heating of the whole roll. Solid rolls, which are made only very seldom, are impossible to coat with rubber of even hardness, and it is also difficult to get the coating to adhere to the rolls.

The surface of the iron body must be free from pores and fat, and should always be roughened in form of a screw to a depth of about 1-25 inch, in order that the hard rubber foundation may get an absolutely reliable hold on the body of the roll during the vulcanization process.

The main purpose for which rubber coated rolls are used in paper mills is to protect felts and wires. The use of a rubber coated roll is also of great importance, when properly handled, for the paper itself.

A rubber lower press roll is simply indispensible for the satisfactory working of a wet press. The rubber roll makes it possible to even out small irregularities in the pulp without crushing the paper.

Every paper-maker knows what a good, elastic, wet press roll means for the felt. If, for instance, a felt happens to pass the press plied, it will not be cut to pieces as between two metal rolls, but will be much less damaged on account of the elasticity of the rubber roll and often not cut at all. It is generally known that a good elastic rubber roll is a factor of the first importance in the lifetime of a felt, even when exposed to a very trying treatment in the presses.

Another reason why a rubber coated lower wet press roll is preferred is that it always keeps a close and even contact with the upper iron roll. Felt washers without a lower rubber roll would be impossible, on account of the saving of the felt and the even pressing out of the water.

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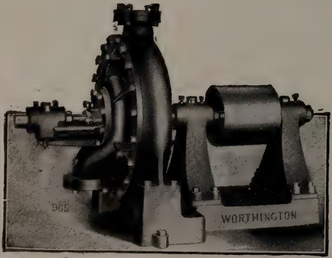

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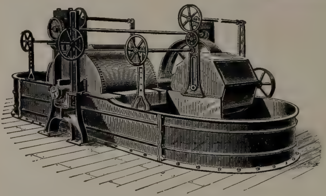

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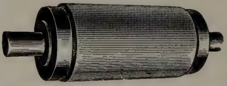

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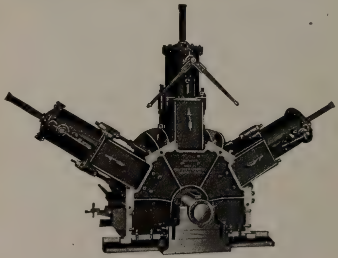

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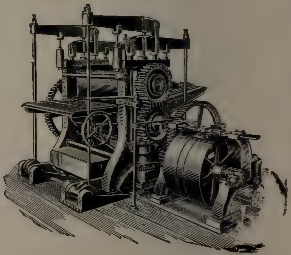

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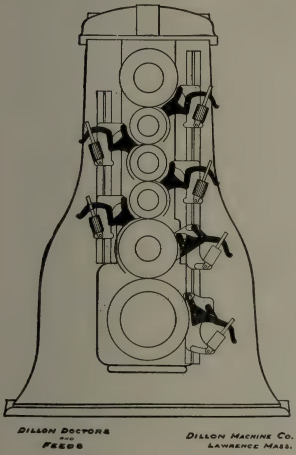

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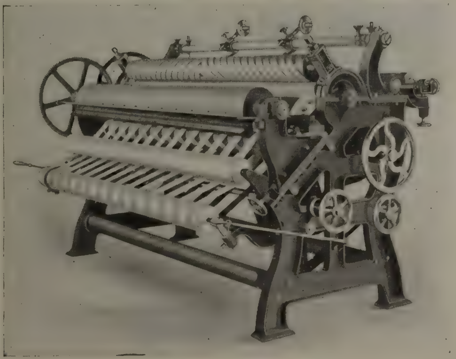

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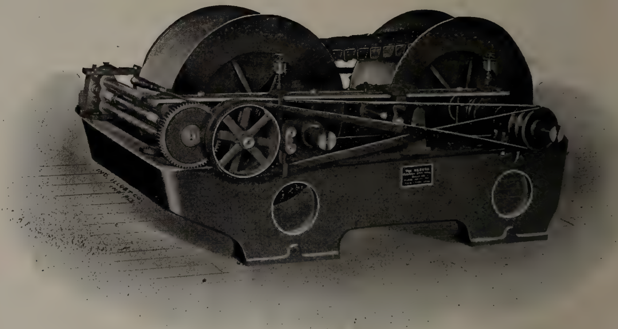

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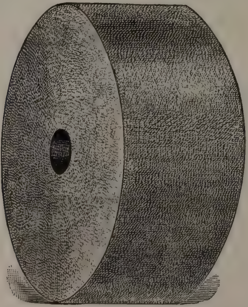

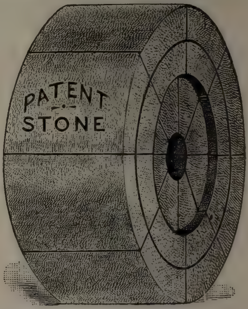

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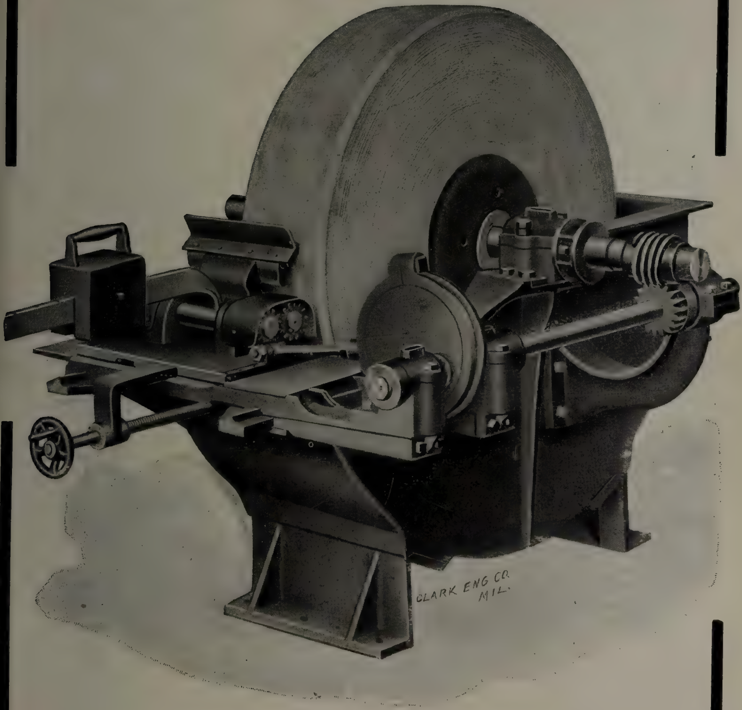

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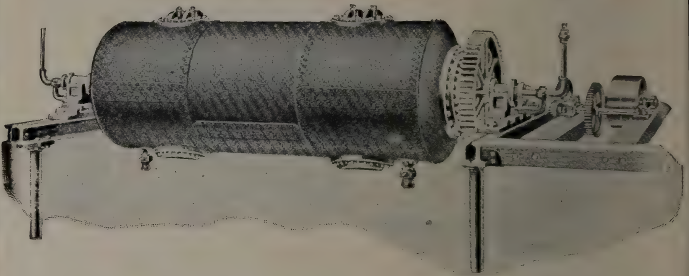

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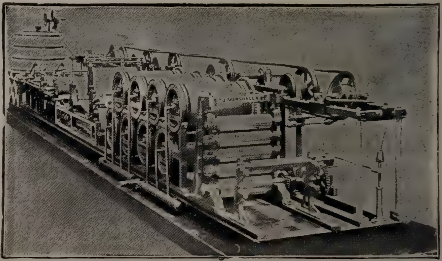

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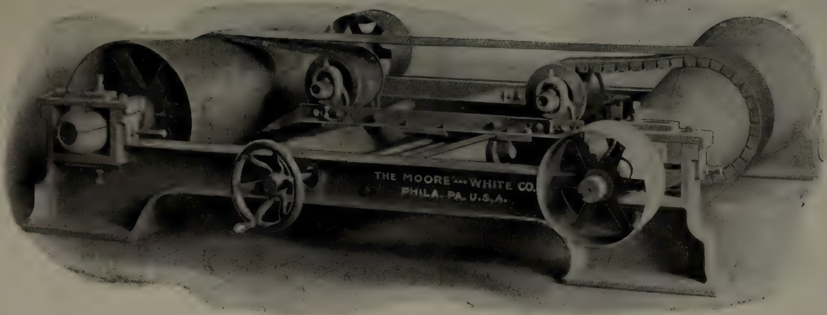

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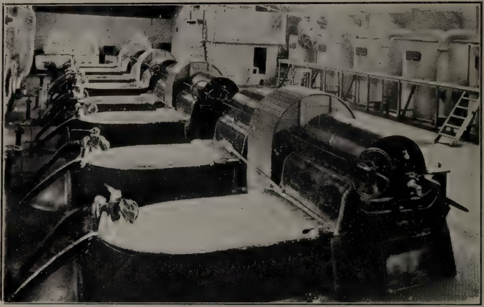

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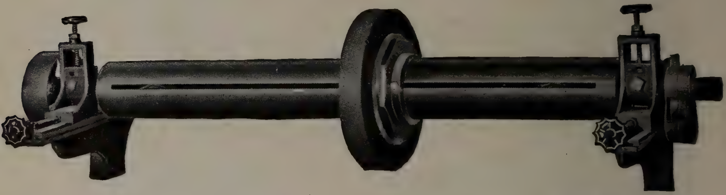

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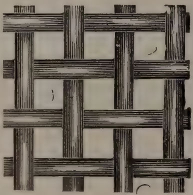

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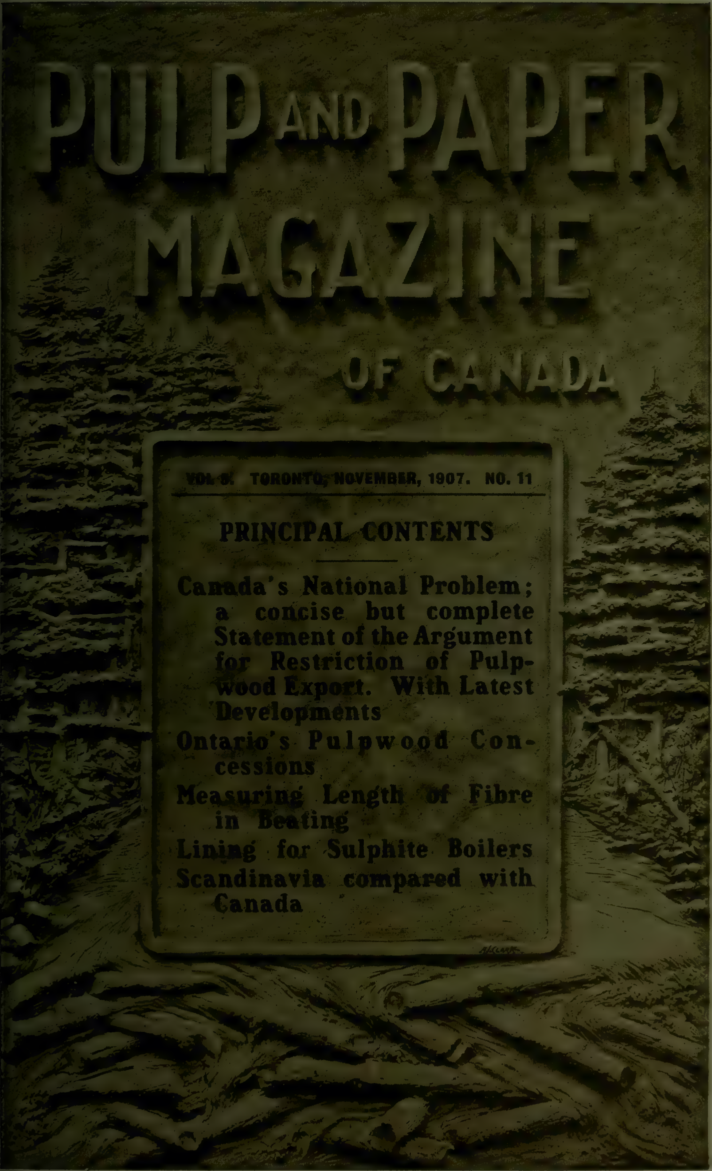

PULP AND PAPER MAGAZINE OF CANADA

VOL 5. TORONTO, NOVEMBER, 1907. NO. 11

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- Canada's National Problem; a concise but complete Statement of the Argument for Restriction of Pulpwood Export. With Latest Developments
- Ontario's Pulpwood Concessions
- Measuring Length of Fibre in Beating
- Lining for Sulphite Boilers
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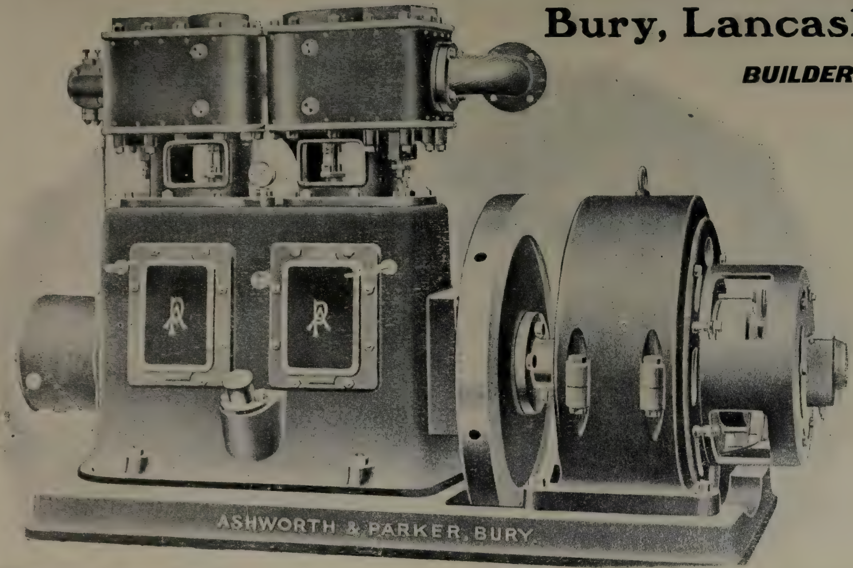

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—The proposed amalgamation of paper mills in the West has been making slow progress apparently in the West, owing probably to the stringency in the money market.

* * *

—Shorter hours of labor in paper mills is a live question in Great Britain at the present time. The Amalgamated Society of Paper Makers have passed resolutions in favor of shutting down at noon Saturday until 6 a.m. Monday. The Paper Makers' Association is considering the suggestion.

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Parties tendering for the pulpwood rights shall accompany their tenders with a marked cheque for 25% of the amount tendered payable to the Treasurer of Ontario, and to be forfeited in the event of their failing to enter into agreements to carry out conditions, etc.

With respect to the Rainy Lake Pulp Concession, tenderers will be required to make a tender for the right to cut the pine, tamarac and cedar on the territory offered. Parties making tenders for these timbers to state the amount they are prepared to pay per thousand feet B.M. as bonus in addition to Crown dues of $2.00 per thousand feet B.Me. A marked cheque for $5,000.00 payable to the Trasurer of Ontario, must accompany the tender for pine timber, and to be forfeited in the event of their failing to enter into agreements to carry out conditions, etc.

No timber shall be cut on either of the Concessions, of a less diameter than 9 inches, 2 feet from the ground.

The successful tenders to enter into agreements with the Government for the erection of the mills. expenditure of money etc.

For full particulars as to the conditions, etc. application should be made to the undersigned.

HON. F. COCHRANE,
Minister of Lands,
Forests and Mines
Toronto, Oct. 16th, 1907.

N. B.—No unauthorized publication of this notice will be paid for.

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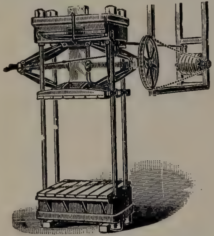

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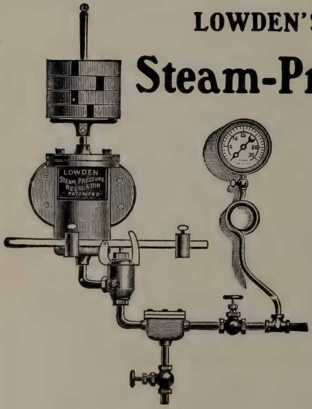

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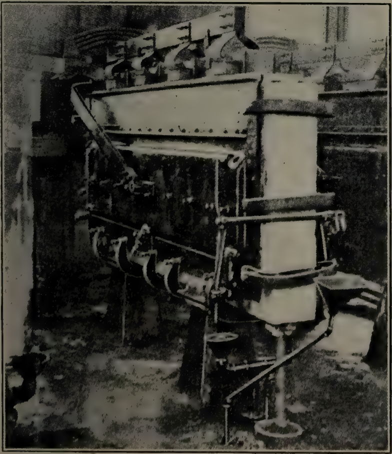

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THE
PULP AND PAPER MAGAZINE
OF CANADA

Vol. 5.—No. 11. TORONTO, NOVEMBER, 1907. $1 A YEAR / SINGLE COPY 10c.

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade

SUBSCRIPTIONS: Canada, British Empire and the United States, $1 a year; to Foreign Countries, 5s. a year.

The Pulp and Paper Magazine is published on the third Tuesday of each month. Changes of advertisements should be in the publishers' hands not later than the 10th of the month. and, where proofs are required four days earlier. Cuts should be sent by mail, not by express.

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THE ARGUMENT FOR RESTRICTION.

During the past few weeks there have been several important developments bearing on the argument for restricting the exportation of pulpwood from Canada. The fundamental argument in favor of such a policy will be found elsewhere in this number, under the caption of "A National Problem," which is being reprinted for general circulation in pamphlet form at 5c. per copy, to be obtained by applying to the offices of the "Pulp and Paper Magazine."

The latest feature is the announcement by President Roosevelt that, as a result of the representations of the Newspaper Publishers' Association, he will recommend to Congress the abolition of the tariff on news paper, wood pulp and pulp-wood, and an investigation to ascertain whether the anti-trust laws are being disobeyed by the paper manufacturers. This proposal affects Canadians in several ways. With the question whether American manufacturers of paper are guilty of a combine, we have little to do, excepting to remark that there are combines and combines. Some are formed for almost the sole purpose of artificially and unduly raising the price of an article to the consumer. With such, there can be little sympathy. But there are other combines which are so only in name, even if in that. When through great increases in the cost of labor and raw material, and of everything which enters into the making of a certain product, the producers at length find they are unable to continue making it at a legitimate profit, without coming to some sort of an understanding between themselves as to what should constitute a reasonable price, then a kind of combine may be said to result, which no reasonable business man should object to. This distinction it should scarcely be necessary to point out; yet it is one which through the means of the sensational press, is largely lost sight of.

The point we wish to make here is that, should President Roosevelt's suggestion be carried out, it means that the taking of immediate steps for restricting or prohibiting Canada's present outflow of her pulp-wood resources, becomes the more imperative. Free importation into the States would at once tend to augment this country's impoverishment of a form of raw material that has already gone away in quantities far too large for her own good. One point in President Roosevelt's proposed policy, viz.; the importation of paper into the United States free of duty, would be welcomed by Canadian manufacturers, but that does not affect the root of the present problem, that is, the perpetuation of our pulp-wood resources; indeed, by the fact that that suggestion is accompanied by a similar proposal to admit pulp-wood free also, the situation is rendered still more acute. The Ontario Government's adoption of more stringent regulations governing future pulp-wood concessions, particularly wherein they call for the manufacture of paper on such concessions, is a move in the right direction, but the regulations even now do not go far enough. There should be something inserted restricting the size of the trees cut, though it is only fair to add that, as we now understand it, the Government intends to make a minimum limit of 9 inches. Laws on this subject may seem somewhat needlessly severe to those who have not fully studied this subject, but it should be remembered that the spoliation of our forests has already gone too far. By rights, we ought now to try to recover some of the lost ground; restriction did not begin soon enough. The recent report of Gifford Pinchot, United States Government Chief Forester, shows how easy it is to slip behind. He says after a journey of investigation covering 5,000 miles, that the timber on public reserves and private holdings in the Republic, will last only twenty years at the present rate of consumption; or, allowing for natural increase of wood, say five years longer. After that, a veritable timber famine!

John R. Barber, well-known as president of the William Barber & Bros. Paper Mill at Georgetown, and connected prominently with several other paper interests, is in favor of placing an export duty on pulp-wood of the same amount as the duty charged by the United States against Canadian wood pulp, and to be retained only so long as the latter is enforced. As to any retaliation which would be made by the United States in the event of Canada placing an export duty on pulp-wood, he believes it would be repealed within two months, and that Canadian pulp would be placed on the free list. Of course, if President Roosevelt's proposal be carried out, this would put another complexion on the matter altogether.

In any event, so far as Canada is concerned, the question is not one of retaliation at all. The history of the United States and the present position of the wood industries in that country, show only too conclusively how easy it is for resources which are supposed to be inexhaustible to disappear, almost in the twinkling of an eye. No self-respecting neighbor which pretends to have any regard for experience, can afford to go and do likewise without at least an effort to find a remedy.

◆

S. A. Cook, representing an Indiana paper mill, was in Canada a few days ago looking up the prospect for obtaining pulp-wood.

MR. PHILLIPS ON CANADA AND SCANDINAVIA.

S. Charles Phillips, editor of the "Paper Maker and British Paper Trade Journal," has been on another visit to Scandinavia. He speaks of the rapidly augmenting production of chemical pulp in Sweden, capitalists and manufacturers being possessed of the idea that there is no limit to the possible expansion of the industry. With regard to the sudden entry of Americans into the market, which has caused prices to jump in a most remarkable manner, Mr. Phillips is of opinion that this development is only temporary; he is sure they will not stay in the market. "Canada," he says, "is the natural hunting ground for American paper makers. They will, of course, take care that this shortage shall not occur very often again. They will—in fact, must—build chemical and mechanical pulp mills in Canada to supply their increasing requirements. I know from my frequent visits to Canada and the United States that the largest American paper making concerns have for some years past been acquiring some of the finest forests and waterfalls in Canada, and that they are quite ready to go ahead and build big sulphite, sulphate and mechanical wood pulp plants as soon as they see the time is ripe. I have impressed on the minds of Swedish pulp manufacturers that what I have stated is beyond doubt. The International Paper Company, the Union Bag and Paper Company, and the Great Northern Paper Company—three of the greatest paper-making concerns in the United States, organizations with an aggregate capital of not less than £20,000,000—have invested enormous sums in Canadian forest lands and waterfalls. The Yankee will not be caught 'napping.' When the time comes he will drop the Scandinavian pulp makers just as suddenly as he took them on."

❦

PULP AND PAPER NEWS.

The Montreal World Publishing Company has been incorporated with the object of publishing a liberal morning and evening paper in Montreal. Capital $150,000.

* * *

The Norwegian steamer "Fortuna," bound from Chatham, N.B., with a cargo of pulp-wood for New York, struck on a rock near Port Mulgrave, N.S., and was damaged considerably.

* * *

The Industrial and Technical Press, Ltd., Toronto, has been granted an Ontario charter. Capital, $100,000. It will carry on a printing, lithographing, and engraving business, and manufacture blank books, etc.

A joint-stock company with a capital of $250,000, has been formed to take over the stationery, paper, and book-binding business of McFarlane, Son, and Hodgson, Montreal.

* * *

It is expected that the Alex. Gibson Railway and Manufacturing Company's lumber business and mills will be transferred to the International Paper Co., of Bangor, Me., at an early date.

* * *

In the libel suit brought by Hon. Adele Turgeon, of Quebec, against the Nationaliste Publishing Company, the case was given to the plaintiffs, the judge finding strongly against the newspaper for alleged gross calumniations.

In the meantime, Mr. Turgeon resigned his seat for Bellechasse, and being challenged by Mr. Bourassa, won it against him in the contest that ensued.

* * *

The growing prominence of the coal beds at Minto, is an important factor in the industrial development of that part of New Brunswick. The coal is easily mined, being only 20 feet below the surface. The two pulp mills at St. John are already using the coal, a ton of which is said to be sufficient to cook a ton of pulp.

* * *

The E. B. Eddy Company's business is increasing so rapidly that it looks as if they will have to increase the size and number of their branches very speedily. We understand the company is looking for new premises in both Montreal and Toronto, as well as in London, Ont. The warehouses in St. John, N.B., and Halifax, N.S., were recently enlarged. Some additional western branches are likely to be opened. Both the Eddy Company and J. R. Booth report great activity, and find difficulty in keeping up with orders.

* * *

H. S. Sprague and others of New York brought action in the High Court, Ottawa, against J. R. Booth, to recover $2,250,000 for alleged failure to consummate the sale of the Canada Atlantic Railroad to them for $10,000,000. Plaintiffs contended that Mr. Booth had repudiated the contract before the prospective purchasers had been given a reasonable time in which to close the bargain. Mr. Shepley, K.C., urged on defendants' behalf that the failure of plaintiffs to conclude the deal on the day specified released Mr. Booth from further obligations. Judgment was reserved.

* * *

The Gillies Lumber Company is taking suits against the Temiskaming and Northern Ontario Railway Commission to recover $90,000 and $24,000 damages for the destruction of timber on their property by fire in 1905, due, they claim, to negligence on the part of the railway. The defence claimed that the plaintiffs, Gillies Brothers, John I. McCracken, and J. R. Booth, are not the owners of either the land or timber on the Gillies timber limits, and that under the terms of the Crown timber license, and as the Temiskaming and Northern Ontario Railway represents the Crown as such a representative, it cannot be held liable. They further disclaimed all negligence in the operations of their trains. A point brought out in examination was that the old Gillies limits had to be sold for $20,000 less than it was worth as a result of the fires. Judgment was reserved.

NEWS OF THE MILLS.

The Imperial Paper Mills, Sturgeon Falls, Ont., are not running any machines at present.

* * *

A. H. Green, an employee of the Kilgour Bros., paper manufacturers and dealers, Toronto, sued that firm for injuries received while operating a cutting machine, and received $1,560 damages.

* * *

An interesting legal action is going on between V. E. Taplin, a pulp-wood dealer of Bracebridge, Ont., and the Riordon Paper Mills, plaintiff claiming $5,000 damages for alleged wrongful dismissal. He was engaged by the firm at a salary of $2,000 and expenses to select pulp-wood and ship it to them. But the mill claims that the wood sent in was very unsatisfactory, not being properly culled, which led to heavy loss when put through the machines.

* * *

E. Guilmette, of Weedon, Que., was accused of cutting a boom at Lake Aylmer, belonging to the Brompton

Pulp and Paper Company, but was discharged by the court on the ground of insufficient evidence.

* * *

R. B. Horton, late manager of the Dominion Pulp Mill at Chatham, N.B., on the occasion of his leaving that company to go to England, was presented with a watch, chain, locket, and pipe, accompanied by an address.

* * *

We regret to learn of the death of John Conlon, president of the Lincoln Paper Mills, Merritton, Ont., and one of the most prominent men in Welland County. He was about 75 years of age and leaves a widow, two daughters and three sons.

* * *

John R. Booth, is applying to the Ottawa city council for an 8-inch water pipe to be installed to his mills on the Chaudiere in place of the present 5-inch. He has recently spent $535,000 on these new mills and feels entitled to a better water supply.

* * *

Jas. A. Mullen, the new superintendent of the Toronto Paper Company's mills, is now installed in his position, the old superintendent having left. The mill will enter upon the manufacture of some new lines of paper, including some finer lines of writing paper.

* * *

Prominent representatives of pulp mills in Illinois, Wisconsin, and other western states made a visit to Newfoundland last month, and under superintendence of J. J. Murphy, of St. John's, visited some valuable timber areas in vicinity of Hawkes Bay. They are understood to be contemplating the erection of large pulp mills.

* * *

The executive committee appointed by the Newcastle, N.B., Board of Trade, to consider Jas. Beveridge's proposal to establish a pulp and paper mill at that place, recommended that he be granted a free site, certain fixed taxation for twenty years, and a supply of water not to exceed 200,000 gallons every twenty-four hours. The committee have obtained options on two properties. Some opposition has developed to the latter part of the proposal, for fear lest the town's water might be diminished.

* * *

Around Fort Frances, Ont., there are large deposits of peat, and as is well known, plenty of water power, besides large quantities of pulp wood. These facts lead the local paper to dwell on the probability of that district becoming the centre of the pulp and paper industry of New Ontario.

* * *

W. C. Edwards & Co., Ltd., lumber manufacturers, Rockland, Ont., and Angus McLean, Buffalo, who last spring purchased the Robitaille limits in Bonaventure County, Quebec, for $400,000, have now taken over from R. W. Leblanc, for $150,000, a controlling interest in large timber limits at the mouth of the Bonaventure River, Mr. Leblanc, being retained as manager. The company give us to understand that plans have not so far been perfected, but that a pulp mill, and possibly paper mills, will be built near the tract early next summer. It is expected that the annual cut of timber will reach 50,000,000 feet.

* * *

Speaking of the Hon. J. D. Rolland, of the Rolland Paper Company, Montreal, the recently elected president of the Canadian Manufacturers' Association, and who is being pressed to stand for the office of mayor of that important city, the "Montreal Witness" remarks:—"He is a man with an unblemished record, and like Sir Wilfrid Laurier in a higher sphere, persona grata to French and English-speaking Canadians alike. He has in his day represented both French and English wards. With Mr. Rolland at the helm we could only wish for the mayor more power than our civic institution gives him. With a council of similar quality the city would rise out of its mire and take the proud place Providence has chosen for it."

The annual meeting of the Canadian Improvement Company (Soo Corporation), scheduled for November 6th, did not take place, owing to an injunction restraining the directors from taking official action. The injunction was obtained by several Philadelphia banks and trust companies, who allege irregularity in the securing and renewal of a $5,000,000 loan from them by Mr. Clergue. The Improvement Company is said to have repudiated the agreement negotiated by Mr. Clergue, and the matter will be threshed out in the courts. The annual meeting and election of officers will now take place on January 7th.

* * *

Sturgeon Falls Council is claiming from the Imperial Paper Mills $4,951.97, and interest, for unpaid taxes. Another development in the situation of the mills is that the unsecured creditors are petitioning the Ontario Government for protection in the event of any disposition being made of the assets. A delegation waited on Hon. F. Cochrane, which includes W. A. Wilson, C. A. Meincke, T. L. Paton, all of Montreal; A. J. Willard, Coos, N.H.; G. E. McKee, Sturgeon Falls, and Hamilton Cassels, K.C., Toronto. As the Crown owns the limits from which the company derives its pulpwood, it is thought that if they be transferred, the Government would be in a position to protect the interests of unsecured creditors.

*

REPRINT OF "GLOBE" PULP-WOOD ARTICLES.

For the advantage of the many who desire to investigate for themselves the merits of the pulpwood question, the Toronto "Globe" has reprinted in pamphlet form the interesting series of letters which its special correspondent has written under the title of "Pulpwood and its Problems." The "Globe" is to be complimented on its judgment in appreciating the importance of this phase of the forestry problem to Canadians, and its foresight in presenting these facts before the public at the most opportune time. The pamphlet is sold at 10 cents, and we would advise every one who thinks of his country's hereafter to study this, and the pamphlet just issued by the publishers of the "Pulp and Paper Magazine" at 5 cents per copy.

*

TRADE ENQUIRIES.

The following enquiries relating to the Canadian trade have been received at Ottawa. The names of the firms making these enquiries, with their addresses, can be obtained upon application to Superintendent of Commercial Agencies, Department of Trade and Commerce, Ottawa, or publishers "Pulp and Paper Magazine":—

1539. **Wood-meal and Wood-flour.**—A London firm, open to take large quantities of wood-meal or wood-flour if the price is right, wishes to be placed in touch immediately with Canadian firms who can export.

*

SORTING WOOD PULP.

While in working with rags the greatest care is taken to sort them into qualities, according to the kind of paper to be made, few paper-makers trouble about sorting wood pulp, although it is just as important in its way as rag sorting. Careless makers would be astonished if they knew the importance of wood-cellulose sorting, especially with reference to thin paper, which must hold a good deal of size. The following are some of the advantages to be secured:—

1. Better working, and hence increased production.
2. Increased toughness of the paper.
3. Saving in cost, in respect that it becomes less necessary to put in expensive fibres, such as esparto, to give the required strength.
4. Saving in size and alum, and all fillings, as less of all these is required.

A NATIONAL PROBLEM.

Thoughtful men are beginning to realize that, apart from the mines and the harvests of the sea, the foundation of our material wealth is the soil and the foundation of soil tillage is the forest. The marvellous achievements due to the control of electricity and the relation of water-power to electrical energy bring home to those who study cause and effect the truth that the greatest asset in the material power of a nation in the twentieth century is the forest. Moreover, a survey of history shows that the decline and impoverishment of some of the greatest nations of ancient and modern times can be traced to the destruction of their forests,—Mesopotamia among ancient nations* and Spain among modern being striking examples.

It has been demonstrated that the planting of forests in a treeless country has increased and regulated the rainfall, and it has been proved with equal certainty that the stripping of the trees from a forested region has made the water supply irregular, and made fertile lands arid.

Lessons of History—Ancient and Modern.

The effect of forest destruction in decreasing the regular flow of rivers has been shown with lamentable consequences in parts of Canada and the United States. For instance, the clearing of the forests from the Alleghany Mountains has reduced those regions to comparative sterility, and has been the direct cause of such fearful calamities as the Johnstown flood, which swept away almost a whole city during the spring freshet which broke up a reservoir. From a like cause, the spring floods which cause frequent disasters and destruction of property in the valleys of the Grand River and Thames River in Ontario, and of the St. Francis and Magog rivers in Quebec, are due to the destruction of the forests on the hills from which the tributaries of those rivers spring.† In those districts, there are men still living who remember streams now completely dry in the summer, which once ran all the year round and furnished power enough to drive mills. The simple reason for such a change is that where forests surround the sources of a river, the snow and rain pass more gradually into the earth and into the tributary brooks, so that the flow of the river is more steadily maintained throughout the year; but if the trees are stripped from these hills, the snows and rains are carried away down the streams in torrents in the spring, leaving the streams low or completely dry in the summer. These sweeping freshets not only cause the destruction of bridges and loss of property, but they wash off the richer surface soil, and where this soil is thin, the land is sometimes reduced to such barrenness that it is incapable of either raising grain or again growing trees. Such desolating changes have been brought about in more than one place in the provinces of Quebec, New Brunswick and Ontario within the past hundred years.

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*Prof. W. K. Prentice, of Princeton University, recently explored a part of Northern Syria, about forty square miles in extent, and in this district he found the ruins of about 150 ancient towns which flourished from the fourth to the sixth centuries, many of them having from 3,000 to 30,000 inhabitants, and one of them—the famous city of Antioch—having half a million. The hills of this district belong to the chain which furnished the celebrated cedars of Lebanon. Many of these towns are entirely deserted, others occupied by two or three families in squalid dwellings, while Antioch itself has only 30,000. The professor gives the most complete evidence that the ruin of this once wealthy region was brought about by the destruction of the forests, and points to it as a solemn warning to his fellow-countrymen.

†The flood damage along the Ohio River alone has been $18,000,000 in the past four years.

The Source of Power.

When we appreciate the growing importance of water-power as a generator of electricity, and when we remember that vast regions of Canada—for example, Ontario, Quebec, New Brunswick, and Prince Edward Island—are devoid of any large deposits of coal, we see the vital importance of maintaining the water-powers of our rivers and streams at their greatest efficiency, if our manufacturers are to thrive in competition with countries having cheap coal. We may thus see what a crime it would be to our posterity if by one supreme act of folly we reduced whole regions of our fertile country to barrenness, and, at the same time, crippled the water-powers on which our future industries must depend.

As past generations of Canadians and Americans have had to clear away the woods to found settlements, and as forests have abounded over an enormous area of North America, many of us have by education imbibed the false notion that trees are an enemy to be got rid of rather than an asset vital to our national prosperity.

In the United States where forest destruction has been carried on to a more disastrous extent than in Canada, people are waking up to the fact that the forest is a national necessity, and, in about forty States of the Union, State legislation has been passed or is being prepared to preserve existing forests and restore those already wasted, especially those at the head waters of the more important streams and rivers.

The Fearful Possibilities of the Press.

Among the destructive agents in the wasting of the world's forests in recent years, the printing press stands preeminent. The experiments of Keller, in Germany, in 1844, by which pulp was produced by grinding wood, and the further experiments of Watt and Burgess in England in 1854, when pulp was made by a chemical process, resulted in greatly cheapening the cost of paper, especially those classes used for newspapers. The method of converting wood into pulp by mechanical grinding was introduced into the United States about 1870, and in ten years this process brought down the price of news print from 9 cents to 4 cents per lb. Since then the improvement of processes and the extension of the industry have further reduced the price till recently it sold at 2 cents a pound. This cheapening has made possible the enormous increase in the size and circulation of the modern daily newspaper—one of the marvels of the age, and as fearful in its possibilities of evil as grand in its possibilities of good to the world. To satisfy this hungry demand of the daily press, the forests of spruce, fir, balsam and poplar in the United States have been slain by counties and States, until now those who have studied the situation begin to realize that America's supply of cheap pulp is at an end, because the remaining areas of pulp timber are either inaccessible or insufficient. Year by year, the United States pulp manufacturers have to go further away for their supplies of timber within their own territory, and year by year, they have had to draw to an ever increasing extent upon the forests of Canada for pulpwood. During the year ending June, 1907, the United States imported pulpwood from Canada to the amount of 650,366 cords, or enough to manufacture say 520,000 tons of news paper, while its imports of ground pulp from Canada were 149,827 tons, valued at $3,230,272. Besides this it imported pulp from other countries, chiefly Norway, to the amount of 63,283 tons valued at $3,118,585, largely chemical pulp. These are official figures of the United States, but while the Canadian official returns show an export to the United States of 452,846 cords in the nine months ending March, 1907, or at the rate of over 603,794 cords for the year, it is the opinion of the "Pulp and Paper Magazine of Canada" that the actual quantity of pulpwood shipped to the United States amounts to from 800,000 to 1,000,000 cords per year. Reasons for this estimate are given in a paper to be found in the Canadian Forestry Association's Report for 1906. According to a special report of the United States Census Bureau the consumption of domestic spruce wood used by United States pulp mills increased 47 per cent. in quantity, and 122 per cent. in price in the five years from 1900 to 1905, while the consumption of Canadian spruce wood by United States mills increased 102 per cent. in quantity, and 150 per cent. in price in the same period. The general cost of wood used for mechanical and chemical pulp was more than doubled in the five years named, for every variety of pulpwood except domestic poplar. Canadian poplar had increased 176 per cent. If these percentages could be applied to the conditions in 1907 the increase would be still greater.

A World's Problem.

As the increase in the number and circulation of newspapers proceeds throughout the world, the difficulty of supplies must increase, unless some substitute, not yet practicable, is discovered for pulp from wood, so that what is now a national problem to the United States and other large paper manufacturing countries, will be a world's problem a few years hence. It is not alone the ever growing demand of the newspaper press, but the manifold uses of wood in other arts which is laying waste the forests of North America, and bringing this crisis near. Industrial statistics recently compiled show that while steel, concrete and other materials are increasing so rapidly for structural purposes, the consumption of wood is greater per head of population in civilized countries than ever before.

The vast expansion of manufacturing in America has brought about this exhaustion of its surplus timber so swiftly that it is only now beginning to be comprehended. It is but a few years, for example, since official documents spoke of the timber supplies of the State of Michigan as inexhaustible; but to-day large numbers of the wood-working establishments of that State have to import their raw materials from other parts of the continent, and the saw mills have had to depend for their operations on logs imported from Ontario, until the recent law of that province compelled the cutting of the logs on the Canadian side, to the great advantage of the Ontario lumber industry. The pulp mills of northern New York* having eaten into the heart of the Adirondack Mountains have now to turn to Canada for a greater proportion of their supplies, while the pulp mills of Wisconsin, supposed also to have an inexhaustible supply of raw material in their own State, have, during 1907, been compelled to haul pulpwood by rail to the extent of about 70,000 cords all the way from the Province of Quebec to eke out their supplies. The last-named development is to some extent due to the conditions of water supply and difficulty of getting timber from the woods, but the irregular water supply is itself due to the exhaustion of the great forest areas and all the facts tend to show the sure approach of the great crisis referred to, and to explain why some twenty-seven states of the American Union have already introduced, while a dozen other states are preparing to introduce, legislation to check this devastation and recover, if possible, the waste already wrought.

Apart from the Adirondacks and the Wisconsin and adjoining regions, the forests of Maine have been cited as furnishing inexhaustible supplies of timber, and as being able to supply the pulp mills of the United States for all time. No doubt these estimates have been believed by those who made them, as was the case with those who believed the forests of Michigan were sufficient for that State's needs, but it is a noteworthy fact that during the present year the International Paper Co., of New York, has obtained wharfing facilities at Portland, Me., to which port it is bringing vessels with cargoes of pulpwood from the coasts of Quebec and New Brunswick for its own mills in New England, some of them in the State of Maine itself, while other American companies have obtained large timber limits in New Brunswick, Nova Scotia, and Northern and Eastern Quebec, with the same object of keeping up the supplies of wood no longer obtainable at home, except at greater expense. Counting the negotiations under way at the present moment for the acquisition of timber tracts in Eastern Canada, United States paper and pulp companies have purchased from 12,000 to 15,000 square miles of Canadian spruce limits. The Union Bag and Paper Co., which owns over 2,000 square miles of spruce limits in Quebec, recently explained to its shareholders, as the reason of reducing its dividend from 7 to 4 per cent., that it was necessary to acquire large bodies of timber in Canada "on account of the rapid increase in the market price of pulpwood, and the rapid disappearance of the spruce forests of this continent." This is, of course, the only reason the other large companies have for buying timber lands in Canada.

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*The 108 pulp mills of New York have a yearly capacity of 987,000 cords of wood, and estimating a growth of 10 cords per acre, these mills would strip close upon 100,000 acres per year. If to this is added the cut for the lumber mills of the State, (estimated by the census of 1900 at about 245,000,000 feet), such a rate of consumption would exhaust the whole spruce supply of the Adirondacks in seven years, if these mills were confined to the timber of that region.

A Land of Illimitable Limits? Canada has the largest forest area of any country in the world, and has also a far greater aggregate of water-power than any other country. Considering the relation of forests to water-powers, and the relation of water-power to electrical energy in a country largely deficient in coal,—at least in its central provinces,—and considering further the relation of forests to those industrial arts in which Canada excels, the conservation of those forests becomes the gravest problem in the whole range of our material life.

The area of the forests of Canada is estimated by Dr. Robt. Bell, of the Geological Survey of Canada, at 2,600,000 square miles, or about 1,657,600,000 acres, of which over half may be in pulpwood. This may appear to afford us timber limits illimitable, but huge areas of these timber lands are inaccessible and will remain so until vast sums of money are expended for transportation facilities, while in our more northerly regions, the annual growth and, consequently, the rate of reproduction, is slower than in areas to the south. Hence, we will find in Canada, as those engaged in the timber trade of the United States have already discovered to their dismay, that the stores of wood commercially available, are by no means inexhaustible. We still have this great advantage, that we can profit by the follies and mistakes of our neighbors, and apply the ounce of prevention rather than wait till we need the pound of cure.

The Self-Consuming Zeal. The zeal and energy of Americans in developing great enterprises, and the devotion of many of them to money, have led them into excesses which have brought suffering to the people, and will, if pursued, cause still more suffering and privation to future generations. The reckless exhaustion of the soil of the western prairies which is largely the cause of the migration of American farmers to the Canadian North-West; the wanton depletion of the white fish and herring on the American side of Lake Erie by American fishermen who after the destruction of their own fishing grounds invaded the Canadian side regardless of Canadian laws or of danger to good relations between two countries; the clamor of the American fur sealing interests for a monopoly of the seal killing in Behring Sea, and the swift decimation of the seals in consequence of securing that monopoly; the fishing by the most destructive methods which has marked the operations of American fishermen on the Atlantic coasts, where many kinds of fish are almost extinct, and where encroachments on the territorial waters of Canada and Newfoundland have caused constant friction between neighboring peoples—these are examples of that zeal or greed for gain which is concerned with its own day and hour, and takes no thought of the claims of posterity.

But the evils that are being brought on the country by all these classes, are of little consequence compared with the destruction of American forests—an evil which in its effects on future generations, may truly be described as the abomination that maketh desolation.

Our Own Danger. The same tendencies that will wreak havoc upon the United States if allowed to grow, are operating in Canada, but it is the duty of those who can shape our public policy to see that special interests are not permitted for their selfish ends to ruin that greatest of all our natural resources which it has taken a bountiful Providence hundreds of years to create, and whose beneficent influence was intended for the whole people and not for a class.

Canada now stands in two dangers—one the uncontrolled desolation by the hands of its own people of the forests which regulate and maintain the water-powers of our rivers and influence the rainfall upon which successful agriculture must depend in the future—the other, the depletion of those forest areas timbered with spruce, balsam, poplar and other woods, which are being taken out of the country to supply American pulp and paper mills, whose home supplies are being exhausted.

The Case of Quebec. It is bad that the forests are thus unwisely treated at our own hands; it is worse when we invite outsiders in to assist in destroying the heritage of our children. Even if this matter concerned only the present generation, and the question were only one of an industrial policy for the passing years, it would be unwise, as the following considerations will show. The value of a cord of spruce pulpwood shipped from the Eastern Townships to the United States four years ago was about $3.50 per cord; while a cord shipped in 1907 is worth $6 to $7 in the rough, or $8 to $10 when peeled. To the latter value—the highest valuation in the history of the province and being in itself a confirmation of the preceding statement as to developments in the United States—add the average railway freight, ($3 a cord), and the money left in the province from the export of the cord of wood is say $10. Now if the same cord of wood* is made into ground pulp in Canada, the result would be $20 per cord, and if it were manufactured into news print the value would be $45 per cord, or if into paper of the higher qualities, the value would be $50 to $100 per cord. Applying these results to the pulpwood exported from Canada and taking the returns of the nine months of the official year as correct, the wood now exported to the United States would, if made into paper in Canada at an average of $50 per ton, yield a product worth over $30,000,000 a year.

This takes no account of the results to the railways and the communities affected by the creation of such an industry. The railway freight tariff on pulpwood is the lowest in the whole scale of freight rates in Canada and the United States. On pulp the freight is double that on pulpwood, and on paper about ten times. Then the creation of a paper industry means a great deal of new trade in machinery, supplies and general merchandise; the latter feature adding traffic and industry to the amount of from ten times to one hundred times the value of the traffic and merchandise directly concerned in the paper trade itself. The creation of a large paper industry would cheapen the cost of Canadian, as compared with foreign papers and would bring into being other industries in paper products not now in existence, such as special kinds of stationery, paper boxes, and utensils made from paper and wood pulp, which are constantly being put on the market in countries whose paper industries are more highly developed than Canada's.

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*A cord of wood will make from 1,850 lbs. to a ton of mechanical pulp.

Thus, if Canada's pulpwood were all manufactured at home, industries would arise whose annual value would be millions of dollars, and yet all this could be accomplished while still so regulating the cutting of trees as to maintain the present rate of reproduction, and so conserving the value of our forests forever. Countries like Germany, France, Austria, etc., by scientifically treating their forests, have been able to restore depleted timber tracts and maintain present forest reserves, deriving from them a perpetual revenue which is a source of benefit to the whole nation.

The Saw Log Act of Ontario.

The economic effect of prohibiting the export of pulpwood may be predicted upon the history of the lumber manufacturing relations of Michigan and Ontario. When the lumber manufacturers of Michigan found the timber supplies of their own State becoming depleted they bought timber limits in Ontario and rafted the logs across Georgian Bay and Lake Huron to Michigan where they were made into lumber. This kept the lumber industry of that State active while the same business languished in Ontario, until the Ontario Government prohibited the export of logs. The Michigan mill owners had claimed that they were not dependent on Ontario logs to keep their mills running, but as soon as the Act was put into actual effect they at once began to move their mills to their Ontario limits, and the lumber industry of that part of Ontario has been in a thriving condition ever since, while the establishment of these new mills has also caused a development of general trade outside of the lumber business itself.

What to Do.

The steps best designed to secure to our country the great national inheritance of its forests are;—first, the prohibition of the export of pulpwood and other woods that now go out of the country in an unmanufactured state; and second, the creation of forest reserves on lands which form the chief water sheds of the rivers—especially rivers containing water-powers—and the gradual re-establishment of forests on those lands which investigation would show are better suited for timber growing than for agriculture. Large areas of such lands now exist in the country where, owing to the steadily increasing value of timber in recent years, tree growing will pay better than grain growing.

The pulp and paper industry has been cited as an example showing the advantage, from an industrial point of view, of prohibiting the export of pulpwood. But the creation of a great Canadian pulp and paper industry is only an incidental advantage in such a policy—the greater purpose is national self-preservation. When our forests are despoiled, our water-powers are crippled, our agricultural regions put in danger by alternate drought and deluge, our great dairy and stock-raising industries must decline for the same reason, and the curse of barrenness must bring its sure blight upon the land as it has done in Spain and Mesopotamia and as it is now doing in great tracts of United States territory.

No matter what the momentary advantage may be to the relatively few whose interests are in favor of exporting wood, we have no right to bring ruin to our children and desolation to our land, for that is what the indiscriminate destruction of the forest means. No one who frankly studies the history of the forests of other lands can fail to realize that, from the material point of view, the forestry question is the question of life and death to this future Dominion. What Canadian worthy of the name would bequeath a wilderness to his children in order that he might live out his own little day with a few extra dollars?

PAPER MILLS IN CANADA, 1907.

Province.	No. of Mills.	Capacity in tons per 24 hours.
N.B.	1	5
N.S.	2	11
Ont.	22	346
Que.	21	604

The yearly capacity of the mills of Canada at present is about 700,000 tons of pulp and 290,000 tons of paper.

The era of manufacturing pulp from wood in Canada began in the decade of 1880-90. Pulp first figures in the trade and navigation returns of Canada in 1890, when the total export was valued at $168,180, of which $460 went to Great Britain, $147,098 to the United States, and $20,622 to other countries. In 1897 the total export was $741,959, of which $164,138 went to Great Britain and $576,720 to the United States. In nine months of the fiscal year ending March, 1907, the export of pulp was $2,984,945, of which $558,600 went to Great Britain, $2,397,448 to the United States, and the balance to France, Mexico, Japan, the West Indies, and Italy.

The exports of Canadian-made paper in the nine months of 1907 were valued at $1,657,740, besides $20,412 of wall-papers. Great Britain was the largest importer of paper, the amount sent to that country in the nine months being $920,272, to Australia $333,326, New Zealand $139-687, and to the United States $109,273. This is a large increase in recent years, the exports for the whole of the year of 1903 amounting to less than $900,000, including wall papers.

PULP AND PAPER MILLS OF CANADA.

How They Have Developed.

The first paper mill in Canada was started at Jacques Cartier, Quebec, by a Mr. Jackson, in August, 1800, and was in successful operation till 1857. The second mill was started at St. Andrew's, Quebec, in 1803, the same year in which the Fourdrinier machine, which was to revolutionize paper making, was introduced into England.

According to the census of 1851, Upper Canada had five mills and Lower Canada had also five. The census of 1871 gave 12 mills to Ontario, 7 to Quebec, 1 to Nova Scotia, and 1 to New Brunswick. The census of 1881 recorded 36 paper mills and 5 pulp mills.

The subsequent progress of the pulp and paper industry is recorded in the "Pulp and Paper Handbook of Canada" in the various editions as follows:—

Pulp Mills.

Year.	No. of Mills.	Total capacity in tons per 24 hours.
1888	34	154
1892	37	312
1899	39	1,145
1907	58	2,361

The total capacity of the mills producing chemical pulp by the sulphite and soda processes in 1899 was about 500 tons per day, and in 1907 about 550 tons per day, so that the increase in the last eight years has been almost wholly in mechanical, or ground wood pulp.

Paper Mills.

Year.	No. of Mills.	Total capacity in tons per 24 hours.
1888	40	173
1892	38	209
1899	33	328
1907	46	966

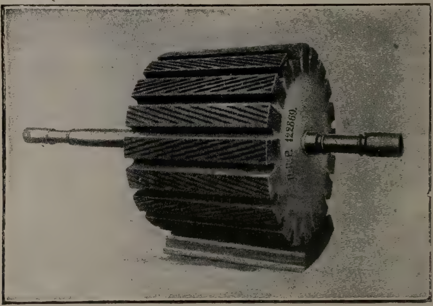
The following table shows the geographical distribution of the mills:—

Pulp Mills, 1907.

Province.	No. of Mills.	Capacity in tons per 24 hours.
N.B.	6	170
N.S.	6	179
Ont.	14	631
Que.	32	1,381

SCHMIDT'S BASALT LAVA STONE BEATER ROLLS.

The Patent Schmidt Stone Beater Rolls and Bed Plates, for which J. Marx & Co., 133-139 Finsbury Pavement, London, E.C., are the sole licensees for the United Kingdom and the colonies, are made of special porous, basalt lava stone, the excellence of which is well known to pulp and paper makers. The surface of the stone acts as a number of sharp points placed closely together, and each imaginary line thereon does the work of the edge of one of the metal knives used at present, but, on account of the porosity of the stone, these edges are not so sharp as to cut the fibres completely; they hold them better, and cause a complete disintegration, and draw out the fibres, without unduly shortening them. The stone roll, therefore, preserves a greater length to the fibre, and the paper has more strength, closeness of texture, better rattle and permanent sizing properties.



Basalt Lava Stone Beater.

The rolls are suitable for all kinds of clean pulp, such as rags, esparto, ropes, bagging, mechanical wood pulp, chemical wood pulp, etc., etc., and for every kind of paper, except blotting and filtering paper which require very short fibres.

With bronze and, especially iron knives, bleached stuff may be contaminated by the presence of the metal, or by rust, which is impossible with the Schmidt basalt lava beater tackle. The advantage of this for fine papers, photographic and sensitised papers is obvious. Should any traces of stone be removed by friction they become finely powdered, quite white, and unacted upon by any substance in the beater. The basalt lava rolls resist all actions of acids and chemicals, and their wear and tear are no greater than that of bronze knives.

The advantages of these basalt lava beater rolls may be summarized as follows:—

(1). They can be fitted to an existing beater, are placed into the old bearings, and are suitable for all fibres.

(2). In most mills where they are running, each beater with the Schmidt stone rolls does the work previously done by two beaters with metal rolls, and in some, especially those making grease proof and imitation parchment paper and similar kinds without chemical treatment, the beating is reduced to one-third and one-fourth of the time previously required.

(3). Stone beater rolls require only very little more power per beater charge and per hour than ordinary rolls, they consequently save between half and three-quarters of the horse-power-hours necessary for each charge.

(4). When Schmidt's rolls and bed plates are used, no metallic impurities can possibly get into the stuff, the whole of the surfaces being of stone.

(5). The circulation in the beater is not interfered with by the Schmidt stone rolls.

(6). The innumerable cutting lines formed by the countless number of sharp points in the porous basalt lava stone do away with the enormous waste of power and loss of energy going on in ordinary beaters.

(7). Schmidt rolls give a longer and finer fibre, and considerably improve the quality of the paper.

(8). No more wear and tear than with bronze knives and bronze bed-plates. Some Schmidt's rolls are now in use for over two years without having been repaired or re-trimmed.

(9). All paper is "made" in the beater, and, with Schmidt rolls, a better and purer quality can be made from a given material than with any other beating tackle.

(10). The Schmidt rolls are made on iron bodies, into which basalt lava stone segments are securely fitted. These segments when worn out or broken can be replaced by new stone segments at relatively very small expenditure.

The handling of the beating engine is, generally speaking, the same for Schmidt's as for rolls and bed-plates in metal. If it is intended to guard the working parts against damage, the stuff in all cases, has to be correspondingly prepared, and there should be no foreign or hard substance in it, which may have a tendency to cause damage. Small buttons, hooks and eyes from wearing apparel cannot do damage to a large extent.

Dry sheets of mechanical, or chemical wood pulp, which have not passed through the edge runner, or kneading machine, should preferably not be put in. Such articles as unprepared ropes, lumps or knots of rags or twine, etc., and also foreign substances, such as iron screws, nuts, or other metal parts, stirrers, washers and the like, must not get into the beating engine or hollander. Similar articles have, on some occasions, passed through the beater, and will always cause more or less considerable damage.

Raising and lowering the roll should be proceeded with in the same way as usual, but the roll should be put entirely down on the bed-plate after the beater is filled, and the furnish is evenly distributed therein, whilst the roll should be lifted off the bed-plate before emptying.

If the roll runs hard on the bed-plate when the beater is insufficiently full, it will be worn down quicker, in the same way as a roll with metal knives. The beater must not be furnished too thick, so as to ensure that a sufficiently large quantity of stuff is always kept between the roll and bed-plate. When the stone rolls and bed-plates are first put into the beater it will be observed that the roll is ground and polished on the circumference, and, therefore, runs in exact circular form.

The stuff will be "ready" sooner than before, and it is therefore requisite to stir the contents of the hollander as frequently for each charge as hitherto, so that, time for time, the stirring must be done at shorter intervals where stone rolls are used; if, for instance, the hollander requires six hours for a charge with metal rolls, which is stirred every half-hour, it will altogether be stirred 12 times; if this same charge should be ready under the stone roll for instance in three hours, it stands to reason that it will be necessary to stir 12 times during these three hours in order to obtain uniform stuff.

Treatment with basalt lava beater rolls results in a better paper than if made under metal knives. The reason for this is that the fibres remain longer and are finer. The stuff in the beater with stone rolls does therefore not "feel" like stuff in a beater with metal rolls, and tests as to whether it is "ready" should be made by dissolving a sample of the furnish in water.

Pulp made under stone rolls, may, therefore, also require different sizing and coloring.

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PAPER MAKERS' ASSOCIATION OF GREAT BRITAIN.

The Paper Makers' Association of Great Britain and Ireland (Inc.), held a general meeting in London on 24th ult., the chair being occupied by Capt. Edw. Partington, vice-president. They had to recognize, he said that they were importing large quantities of paper and were exporting to some extent, but there was a great difference between the comparative values, and it would be interesting to know if any solution could be suggested of the difficulty in order to bring exports more in line with imports. Mention was frequently made of new fibres, but there was at the present time nothing to compare with wood. A discussion took place on the important question of trade customs. Lewis Evans suggested a conference of British, American, and foreign paper makers with a view to arriving at an international standard in this respect.

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LAURENTIDE PAPER COMPANY.

The statement of the Laurentide Paper Company, Limited, presented at the recent annual meeting held in Montreal, showed a very successful season of operations for the fiscal year ending June 30th, 1907. Net profits, after all interest charges on bonds and loans had been paid, amounted to $283,321, compared with $271,845 in 1906. The amount earned and available for distribution on behalf of holders of common stock was equal to 12.45 per cent. on the $1,600,000 of common stock outstanding. The record of the previous year worked out at 11.74 per cent. As the dividend payable on the common stock is at the rate of six per cent. per annum, there is a very substantial surplus carried to the credit of profit and loss for the past two fiscal years. The total amount available for distribution, after payment of course, of fixed charges, and including $159,645 brought forward from the previous year, was $442,967, out of which preferred dividends at the rate of seven per cent. per annum were paid, amounting to $84,000; two half-yearly dividends at the rate of six per cent. per annum were paid on the common stock, amounting to $96,000. This left $20,000 to be placed to depreciation reserve, and a balance of $242,967.07 to be carried forward as surplus to the profit and loss account of the current fiscal year. This surplus is equal to over fifteen per cent. on the common stock paid-up. Directors were elected as follows: Sir William Van Horne, K.C.M.G., Richard B. Angus, James Ross, Charles F. Smith, Charles R. Hosmer, Edwin Hanson, George Chahoon, Jr. At a subsequent meeting of directors Sir William Van Horne was re-elected president and George Chahoon, Jr., vice-president.

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—In the nine months ending October 31st, Canada exported 452,846 cords of pulp-wood, valued at $1,998,805, all of it going to the United States; of pulp she exported $2,984,945, of which $2,397,448 went to the United States. Of paper, Canada exported $109,273 to the United States, $920,272 to Great Britain, $333,326 to Australia, and $139,687 to New Zealand.

—At the annual meeting of the International Paper Co., held at Corinth, N.Y., on October 23rd, the report of the treasurer was read and showed net earnings for the year of $279,214. Officers were elected as follows:—A. N. Burbank, president; Hugh J. Chisholm, chairman of the Board of Directors. The position of first vice-president remains unfilled for the present, while the other officers were re-elected as before.

ONTARIO PULP-WOOD CONCESSIONS.

The Ontario Government has formally approved the terms governing the lease for a period of 21 years of two pulp-wood concessions, for which tenders are now asked (up to December 16th). Its decision as to its policy in dealing with such concessions in the future is based, as already stated in these columns, upon the principle that the raw material must be manufactured into paper in this Province, either on the concession or at some point agreed to by the Government. The concessions to be offered are respectively known as the Nepigon and the Rainy Lake concessions, the one in the Thunder Bay district and the other in the Rainy River district. The former is the larger, and is in the Nepigon forest reserve. It comprises territory of a considerable area running five miles back from the Nepigon River and five miles back from the shore of Lake Nepigon. The successful tenderers for the concession will be those who pay the largest bonus, in addition to the dues of 40 cents a cord for spruce and 20 cents a cord for jack pine and poplar, the other pulp-woods. All tenders will have to be accompanied by a marked check for 25 per cent. of the bonus offered. In the case of the Rainy Lake concession, on which there are some scattered pine, tamarac and cedar, the tenders will have to take these in consideration, as the right to cut them will go only to the party obtaining the pulp-wood concession. This right will be subject to the largest bonus offered in addition to the usual dues of $2 per 1,000 feet board measure. Separate marked checks for $5,000 will have to be included to cover the right to cut these timbers by those tendering on the Rainy Lake concessions. No pulp-wood less than nine inches in diameter at two feet from the ground may be cut.

The successful tenderer for the Nepigon concession will have to build within three years mills costing not less than $500,000, capable of manufacturing at least 150 tons of paper a day, and employing 250 hands for ten months in the year. The party getting the Rainy Lake concession, which is smaller, will have to build mills costing $150,000, at which at least twenty tons of paper a day can be made, and employing 50 hands.

MERCK'S 1907 INDEX.

The third edition of this encyclopedia for the chemist, pharmacist, and physician is now issued, stating the names and synonyms, source of origin, chemical nature and formulae, physical form, appearance and properties, melting and boiling points, solubilities, specific gravities and methods of testing, physiological effects, therapeutic uses, modes of administration and application, ordinary and maximum doses, incompatibles, antidotes, special cautions, hints on keeping and handling, etc., of the chemicals and drugs used in chemistry, medicine, and the arts, 472 pages. Bound in cloth. New York: Merck & Co. Gratuitous to users of chemicals upon receipt of 25 cents to cover expenses incidental to delivery.

* * *

—At the third annual meeting of the Federation of Trade Press Association of the United States, a feature was the presence at the accompanying banquet of Postmaster-General Hon. L. Meyer, and other high Post-Office officials and their promise to further the interests of the Federation and the trade press generally. The sentiments they expressed showed to what a high place the Trade Press has advanced. They called upon the publishers of legitimate papers to help the Post-Office in weeding out fakes, not only in their own interests, but for the general business welfare of the country.

LINING SULPHITE BOILERS.

Many kinds of linings for sulphite boilers have been proposed, and while not one of them is thoroughly satisfactory, there are so many which answer fairly well, that it is difficult to decide which is the best. Many things have to be considered. Lead has many advantages as a new lining, but it is expensive to begin with, and entails costs for repairs and loss of time while the repairs are being made, which are only partially made up for by the sale of the old lead.

An excellent lining is prepared, says a German paper, by making a sort of putty with Portland or Roman cement and water-glass, and applying it to the inside of the boiler, so as to make a lining about half an inch thick. This is covered with fire-brick, and serves as a mortar for the bricks. This lining cracks a little when fresh; but if the cracks are filled with fresh mortar as they appear, an extremely solid lining is obtained, which is capable of resisting the action of the sulphur dioxide in the boiler for practically an indefinite period. If circumstances permit of the use of straw, the efficiency of this mortar is greatly increased by mixing it with the stalk in a very finely chopped state. The silica which gives the stiffness to the straw, is extremely resistant to sulphurous acid. The straw must be chopped as fine as possible. It cannot be too fine. Its presence not only increases the durability of the mortar—which is, of course, exposed to the action of the sulphur dioxide, just as the bricks are—but augments its binding effect upon the bricks. The fire-bricks are used only to save cement. A lining made solely of cement, water-glass, and chopped straw would answer perfectly; but it will have to be much thicker than when it is used in conjunction with fire-bricks, and would be much more liable to splinter off if no fire-bricks were used. It is interesting to note that the first time the boiler is used after having been lined a reaction takes place between the water-glass and the sulphur dioxide. This wastes a trifling amount of the latter, but at the same time the insolubility of the lining is thereby increased.

As regards the repair of cracks above alluded to, it may have to be executed fifty or even sixty times; but, if the lining has been carefully done, the inner sheathing will be perfect after a much smaller number of times of use of the boiler. Everything depends upon skilled preparation of the cement and water-glass mixture, especially if chopped straw is used with it. The inorganic materials must be good, and the straw must be chopped as small as is reasonably practicable, and all the ingredients must be perfectly mixed. The bricks, again, must be well laid so that they stand the chief brunt of the chemical action of the sulphur dioxide.

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—J. Marx & Co., Chiswell House, 133-139 Finsbury Pavement, London, E.C., have just supplied three large beaters with stone rolls to the largest news mill in the United Kingdom which, like many others supplied to British and Continental paper mills, are giving great satisfaction, as is shown by the number of repeat orders that firm is constantly receiving. Some mills are using as many as twenty of their rolls. They are making a specialty of beaters with two rolls, with and without propellers.

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—A dispatch from Appleton, Wis., last month stated that the steamer "Carleton" had just unloaded at Green Bay City a cargo of pulp-wood, part of 50,000 cords purchased by the Wisconsin Pulp-Wood Company, in Quebec. The price is said to have been between $15 and $16, but Wisconsin pulp manufacturers are "up against it."

NEW PROCESS OF PULP BLEACHING.

The Revue de la Papeterie describes a new process that is applicable to bleaching pulps and other substances which have up to the present been considered as not suited for the manufacture of white paper. The pulp is lixiviated one or more times with lime or soda by ordinary methods. Washing in clean water follows each operation or the final one, so as to obtain a neutral pulp absolutely free from traces of a reagent.

After washing in clean cold water treatment with soap follows, so as to facilitate the expulsion of the coarse and impure ligneous particles, which are more easily separated from the fibres in the fatty centre thus produced, the wood pulp thus acquiring an incomparable softness and suppleness. This soaping can be effected in a vat or a vessel provided with agitators. It can be done in a bath of sulpho-ricinate of soda, or in a solution of 1 to 2 kilos. (2.2 to 4.4 pounds) of caustic soda and 2 to 3 kilos. (4.4 to 6.6 pounds) of ordinary soap for each 100 kilos. (220 pounds) of white pulp.

Following washing in clean cold water, two processes of lixiviation with caustic soda ensue, washing with clean cold water again taking place, followed by a chlorate bath, which indicates 2 to 4 chlorometric degrees. When all trace of reagents has been removed by washing in clean water with a slight addition of hypo-sulphite of soda, bleaching and the other subsequent operations are proceeded with.

Bleaching is then commenced by brewing during four to six hours the substances and pulps lixiviated and chlorated in a bath prepared as follows:

In the quantity of clean cold water necessary to moisten the substances is dissolved a quantity of one-half to 3 kilos. (1.10 to 6.60 pounds) of alkaline peroxide to each 100 kilos. (220 pounds) of this pulp, according to its condition of preparation for bleaching. There are added to this solution from 10 to 30 kilos. (22 to 66 pounds) of neutral alkaline silicates at 35 degrees Reaume for each 100 kilos. (220 pounds) being treated.

The object of the silicate is to increase the density of the bath and to form around the molecules or fibres of the pulp a layer protecting them against the too sudden oxidation due to the release of the oxygen emanating from the peroxide.

During the continuous brewing the temperature is gradually increased up to about 80 degrees C. (176 degrees Fahr.) in order to produce the decomposition of the peroxide, the bath not containing any reagent. The oxidation is thus regulated throughout the mass without altering the resistance of the molecules of the alkaline silicates.

✣

FOREST AREA OF VARIOUS COUNTRIES COMPARED WITH CANADA.

Canada	1,657,600,000 acres.
United States	500,000,000 acres.
Russia	812,600,000 acres.
Austria-Hungary	93,000,000 acres.
Sweden	49,000,000 acres.
Norway	17,000,000 acres.
France	23,000,000 acres.

✣

—There was an informal meeting of paper manufacturers in Montreal last week to discuss trade regulations and such matters. The most important subject was cash discounts, which, under present circumstances, work as a hardship to the paper manufacturers. For their supplies of pulp and other materials, wages, etc., they have to pay net cash; and, to make things fair all round, the feeling is that they should have a similar arrangement for goods they sell.

THE MARKETS.

Toronto, Nov. 18, 1907.

General business in Canada has been affected somewhat during the past month by the stringency in the money market and the rather depressing conditions in the United States. But the paper trade shows but little, if any, sign of reaction, though the poorer grades of book are in slightly duller request. Demand is active, and prices rule firm, and news is especially likely to make some slight advances in the near future. There is some degree of comparative easening off in the pulp situation, but prices can scarcely be said to be actually any lower. Ground wood is $22, f.o.b. mill; sulphite, $2.30. These prices are too high for the present values of most papers, and manufacturers of the latter are complaining.

British.—The market for pulp is firm for 1909-1910, for which period business is in treaty in considerable volume. For early shipment there is scarcely anything available, whilst for 1908 the quantity to be had is exceedingly limited. Mechanical wood pulps are very firm, especially for delivery this year, and high prices are obtainable. Moist (unwrapped) mechanical is realizing not less than 66s. c.i.f., and wrapped has been sold for prompt at 70s. c.i.f. There is a steady demand for chemicals, both for home and export, says "World's Paper Trade Review."

PAPER STOCK MARKET REPORTS.

Montreal, Nov. 18, 1907.

Paper stock is in good demand. The shortage and other factors have increased the demand for waste papers of all kinds. Considerable shipments of satinet for roofing felt stock are also coming over, but the demand for these is not as active as it was. The scarcity of money is affecting some of the smaller packers.

Quotations are as follows:—

Unbleached cuttings ...	$4 50	to	$5 00
White shoe clips	4 50	to	5 00
Colored shoe clips......	3 00	to	3 25
Domestic white rags....	2 25	to	2 50
Blues and thirds........	1 25	to	1 50
Roofing stock	90	to	1 00
Manilla rope	2 50	to	2 75
Waste papers	90	to	45
Bagging	90	to	—

SCANDINAVIAN PULP MARKET.

"Farmand" states that the market for sulphite continues to harden under the influence of a strong inqury for 1909 and 1910, and makers who are nervous as to the probable future cost of production now demand for delivery over these two years upward of kr.155 f.o.b., for easy bleaching quality. For mechanical pulp there is a spirited demand both from the Continent and the United Kingdom, and the market is decidedly stronger in consequence, kr.45 being asked as a minimum for delivery over 1908. Considering that fully 80 per cent. of the calculated combined output of the Norwegian and Swedish mills for next year has already been placed, it may be a long time before next year's delivery commands the same extreme price as is already obtained for the small lots which are still available for this year, say kr.53 to 55 f.o.b., for stave packed ordinary brands. It repeats its advice to foreign paper makers to secure their supply of their most important raw material for some years ahead, while they can still do so at a comparatively moderate cost, and to see to it, the sooner the better, that they get an advance upon the price of paper. The leading Norwegian paper mills, it is understood, are prepared to co-operate cordially with the paper-makers abroad, both in Sweden and elsewhere, in an effort to bring about the necessary readjustment of paper prices to the enhanced cost of production.

DYEING OF PULP.

Paper may well be considered as a textile product, for it is really a compressed and sized felt made from vegetable fibres in which animal fibres may be often present. Viewed in this light its coloring is a fit subject for review in these columns. Without going deeply into the question of what fibres go to make up the pulp and their individual properties, we may class them, first, as woody fibre, which comprises all wood pulps of course; then the vegetable fibres having the nature of jute, hemp, flax, straw, etc., which have the property of taking up basic dyestuffs without the aid of a mordant. Next, the class of pure cellulose, which principally refers to cotton fibres and any others (if they are used) which do not take basic dyes without the aid of a mordant. Last, animal fibres, either accidentally or purposely added.

We presume the material to have been prepared by the paper maker and in the beater ready to receive the color. Usually the first step is to add the sizing, which is an alkaline rosin soap, and when this is thoroughly incorporated, sufficient alum is added to set or precipitate it throughout the pulp mass. Silicate of soda is used in some instances and filling or loading materials which serve to give the paper more uniformity, resistance to dampness and a smooth surface. They all act, in some measure, as a mordant for the dyestuff, so that, as a rule, the paper maker does not stop to inquire what fibres are present, but goes ahead and dyes all alike, and does not stop to think whether the dye is combined with the fibre or has formed a color lake with the filler. The final result looks the same, and that is all that is required. When special fastness to light is called for, the usual way is to use pigments like Prussian blue, chrome yellow, lamp black, etc., which are held mechanically as fillers. As these are only used in special cases, aniline colors are usually used. Three classes of dyestuffs are in use, viz., basic, acid, and direct dyestuffs. All the basic dyes are available, but of the acid dyes only those of the azo class, which may be precipitated by alum, are really suitable, although a number are used which are unsuitable and wasteful. Of the direct cotton dyes, only those should be used which dye cold or are fixed by alum without being affected by its acid nature. Suitable combinations of acid and basic or direct dyes may be used if attention is paid to the proper working of the dyes. With a cotton or wool dyer a standing bath is possible and often desirable; but with a paper maker the aim is to get a clear backwater and as little loss of dye as possible. This can only be when the dye is taken up by the fiber or when fixed in an insoluble state in the filler. The precipitation of the dye outside the pulp is in general to be avoided, and therefore it is best to dissolve the dyes separately if they are not of the same class. Use condensed steam for dissolving them, if it can be had, and always strain through cheese cloth or very fine brass screen. A few specks of undissolved dye will ruin the color of the whole beater of pulp, because each speck spreads and the first rolls the paper goes through will crush the speck perhaps and spread it still further. A perfect solution of the dye is best made by stirring it in cold water and boiling with an open steam pipe. Auramine, however, will not stand boiling. Acetic acid in small quantity is generally used in dissolving basic dyes, but too much must not be used, as it will prevent them from being properly fixed. Direct cotton dyes usually dissolve perfectly; but at times a small quantity of soda crystals is helpful.

Having the dye dissolved, it is then diluted with water still further, and distributed by buckets or other means all around the beater. Some will still dump all the dye in a strong solution at one point and depend on the beater to blend it. The results may satisfy some, but are not as good as when all the fibres are tinted evenly. At times mottled and mixed effects are desired, and are made by putting all one dye in one place and another dye in another place and not mixing too thoroughly afterward. Where but one color is used, for instance safranine for a pink, it may be claimed that to have 10 per cent. of the fibres strongly dyed and well mixed with 90 per cent. of undyed fibres, so the naked eye will not notice the motley effect, is better than to have a delicate but uniform tint on the entire 100 per cent. of pulp, because the darker color fades slower than the light tint, and the final effect will be more permanent. To this argument we may say that to have a fibre overloaded with dye is to decrease its fastness, while where the dye has an excess of fibre to hold it its relative fastness is much better. This not only refers to fastness to light, but to water; and, as most colored papers are meant to be pasted, it is desirable that the color does not bleed. In using combinations of colors for fancy shades, dyes of one class should be mixed before putting them in the beater. In case acid or direct dyes are used with basic dyes, use the former first and tone up with the basic dye later. This will cause a precipitate to form and all the color being retained, the backwater will be clear. Some paper colorers always aim to use their colors in this way, in order to save dye and to increase fastness to bleeding; but if the precipitation takes place between the acid and basic dyes without one of them being set on the fibres, the result is a stringy, tarry mess that will ruin the pulp.

The number of dyestuffs one may choose from is very large, but the number in common use is quite small. As each of the large firms handling dyes has its own brands, which may differ slightly in both shade and strength as well as price, we can only speak of the dyestuffs by their general names. The common basic colors are:

Safranine (B, G, RS, etc.).
Methylene blue, (2B, O, 2O, 3O, etc.).
Methyl violet (2B, R, 5B, etc.).
Malachite green (crystals and powder).
Auramine (II, O).
Chrysoidine (G, R, 2R, etc.).
Bismarck brown (R, B,G, etc.).
Fuchsine (G, R, etc.).

⁂

MEASURING LENGTH OF FIBRE IN BEATING.

Very little work has been done in the direction of measuring the actual length of fibres during the process of beating in the preparation of pulp for the manufacture of paper, so Clayton Beadle and Dr. Stevens made arrangements with a well-known firm of paper makers to withdraw samples of pulp from the hollanders, of the ordinary type and of about 3 cwt. capacity, during the beating operation, and while the beaterman manipulated the roll in the ordinary way for the manufacture of the paper that he had to provide for. In this manner, samples of pulp were taken every hour. There was no attempt to determine the length of the fibre at the commencement of the beating, as when the fibres are in the condition of rag "half stuff" it is almost impossible to arrive at even an approximate estimate by means of measurements under the microscope. It might be assumed, however, that the cotton and linen fibres as "half stuff" are intact, and therefore an average length of each, based on published figures, may be taken as representing the length of the fibres as half stuff. As, however, such a figure is a pure assumption, the length of fibre is given in tables and curves as from the end of the first hour in each case. Furthermore, measurements made at an earlier stage in the beating would have no practical value.

With very long stuff, or stuff that has been very little beaten, it is extremely difficult to arrive at the average length, because it requires a great deal of experience to obtain on the "field" a representative set of fibres, many of them being in the form of threads or small woven particles. When, however, the work of unraveling the thread is accomplished, the measurement can be more easily made. Where possible, two sets of readings were taken of each sample, each set consisting of ten determinations for length and diameter. The measurements were made under a magnification of seventy-two diameters. The average of each set should bear a fairly close correspondence with one another, and each set should be the result of measurements of different "fields." As indicating the extent to which the individual fibres varied in length, we give in Table I details of measurements for the ninth hour. In Table II. we give a summary of this trial on linens beaten for ten hours. Tables III. and IV. are summaries of similar trials.

Table I.—Details of Measurements of Linens after Nine Hours' Beating.

	Length. Mm.	Length. Mm.
	2.92	1.87
	2.64	3.82
	2.43	2.22
	2.50	1.74
	2.16	2.92
	2.71	2.82
	2.85	2.78
	1.81	2.78
	3.61	3.61
	3.82	3.40
Mean......	2.74	2.80

Mean length of 20 readings...2.77 mm.

Mean diameter of first 10 readings ....—0.0187

Mean diameter of seccond 10 readings ....—0.0181

Mean diameter of 20 readings..—0.0184

Table II.—Examination of Linen Pulp at different stages of the beating for length of fibre.

(Beaten for 30 lbs. 21 x 33 inches).

Hours of Beating.	Average Length. Mm.	Average Diameter. Mm.
1	13.3	0.0222
2	9.4	0.0227
3	5.62	0.0260
4	4.37	0.025
5	3.92	0.023
6	3.37	0.021
7	3.58	0.020
8	2.89	0.0185
9	2.77	0.0184
(a) 10	2.14	0.023

Table III.—Linens Beaten for Five Hours at different stages of the Beating.

Hours of Beating.	Average Length. Mm.	Average Diameter. Mm.
1	6.34	0.0177
2	2.84	0.0190
3	1.82	0.0186
4	1.94	0.0174
5	1.70	0.0199

Table IV.—Cotton ("Scotch Fines") at different stages of the Beating.

(Beaten for 100 pounds Imperial).

Hours of Beating.	Average Length. Mm.	Average Diameter. Mm.
1	3.59	0.01855
2	3.40	0.0180
3	2.34	0.0208
4	2.26	0.0184
5	2.02	0.0181

It will be noticed that, in the case of Table II., there is, with one or two exceptions, a decrease in length of the fibre from hour to hour The same will be noticed in respect to Tables III. and IV. Where the fibres showed any marked irregularities, the work was carefully repeated.

In the case of the cottons, the diminution is apparently somewhat spasmodic, the result possibly of a sudden lowering of the beating roll. It will be noticed that, during the first two hours there is a very great diminution in length, but during the second half of the beating the length is only influenced to a comparatively small extent.

TURPENTINE FROM PULP WASTE.

A process has been invented by C. B. Clark, at South Brewer, N.H., for making turpentine out of pulp waste in large quantities. The processes by which this turpentine is obtained have all been patented, and after the installation of the proper machinery the turpentine can be obtained from the waste in large quantities.

In all pulp mills there is a great deal of waste in the cooking of the wood from which the pulp is made. Spruce is the wood most largely used for the manufacture of pulp. The spruce wood has to be cooked so that all the sap and other useless matter is taken out of it and the fibre left clean and free from everything that would lower the quality of the paper made from it. Spruce wood, of course, contains a great deal of pitch, and a large part of the waste matter from the Eastern Manufacturing Company's mill has consisted of the pitch cooked out of the spruce. Mr. Clark conceived the idea of saving the pitch and turning it to account, so, after long study and experiment, he devised the process which has already proved very highly practical and a great money saver.

Heretofore turpentine has been obtained practically wholly from southern pine. Of course, there is many times as much pitch in southern pine as there is in northern spruce, and where the southern pine lumber itself can be used to make the turpentine, such a method would never do in the case of spruce, for, if the spruce lumber were used, the turpentine would be worth more than the lumber itself. By Mr. Clark's process, however, the turpentine is obtained from waste matter which has hitherto gone into the sewer.

The turpentine obtained as a by-product in the manufacture of spruce pulp answers all the purposes of pine turpentine. The ordinary person could never tell the difference between the two. It was only a short time ago that the turpentine was placed on the market and it has been found to be of such commercial value that now it cannot be produced in sufficient quantities to satisfy the demand. In a short time, however, proper machinery for the extraction of the turpentine will be installed.

* * *

Rafting on the St. John River, New Brunswick is about over for this season. The quantity of logs cut was not so large as usual, owing to unfavorable conditions in the market.

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FEATHERWEIGHT PRINTING PAPER.

The above expression, "Featherweight Printing Paper," is used in Germany to mean a very light but bulky paper which takes print well and is as white as possible, being chiefly used for novels and similar literature. Such books look thick, and thus appeal to the travelling public, a book seeming to contain some 700 or 1,000 pages only having half that number in reality.

In making paper of this character light, absorbent and bulky raw materials are employed, which can be purchased at moderate prices. Rags are much too dear to be used in large quantities, the loss of weight in bleaching being, moreover, an important factor in their cost. A large proportion of cellulose is mixed with a small quantity of cotton rags. Good soft ground wood is considered the most suitable.

For the production of this class of paper the writer of an article in the "Papier Fabrikant" took about 40 per cent. of soda cellulose, parly from red beech and partly from aspen wood. This cellulose has large volume but very soft. The remainder included 15 to 20 per cent. of soft cellulose and 10 per cent. of wood pulp. In order to increase their volume these substances, after being bleached in a specially prepared lye, were let stand for three to four days, so as to rise. The balance of the composition was represented by waste.

This mixture is rendered thin in a hollander of 550 pounds capacity, being lightly ground for two and three-quarter to three hours, and then quickly emptied out. In such a hollander sizing is effected with equal to about 35 to 40 gallons of size, the proportion of rosin being calculated at about equal to two and seven-tenths ounces to the gallon. The rosin is precipitated with about 15 gallons of alum, so that 1 gallon of alum fluid is estimated to contain about equal to 13 3-10 ounces of alum. In this way about three-quarter sized printing paper is produced. With a view of avoiding specific weight, there must of course be no admixture of earthy matter. Featherweight paper is usually seen ribbed, this effect being better produced by a transverse ribbon than by a longitudinal one. The suction appliances must only draw a little so that the substance may not be needlessly close.

In addition to other suggestions it is remarked that the drying process must do the rest. The inlet valves to the drying cylinders need to be only very slightly opened, for on account of the loose nature of the web it dries very easily of itself. Too sudden and forcible a drying always causes shrinkage and compression, the result being a hard and brittle paper, which cannot be designated as "featherweight."

⁂

SYSTEM OF MEASURING PULPWOOD.

"Cubic Measurements" is the title of a new publication just brought to our attention. It is intended to be of interest to pulp and paper makers who receive pulpwood by carloads. The tables yield the cubic contents of any sized car, figuring tier by tier, and cover a wide range of measurements, wider really than are actually required. The use of such tables should prove of value, not alone for their accuracy, but as well for time and labor saved in calculating cubic contents, especially when the dimensions run to odd fractions of a foot. Copies may be obtained by applying to the author, A. M. Osborn, St. Gabriel de Brandon, Que., price, $1.00.

⁂

There has been a large increase in number of timber licenses granted in British Columbia during the last three months, especially west of the Cascades. Fees for October amounted to $143,048.

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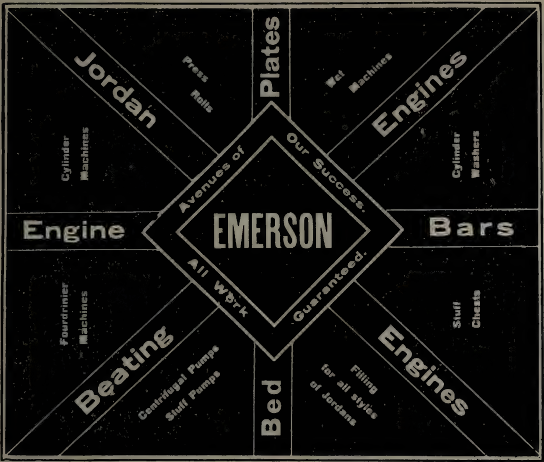

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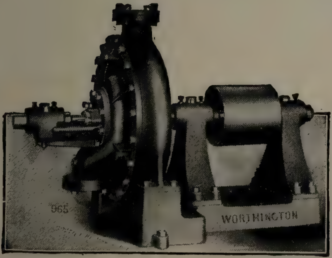

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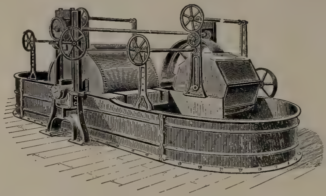

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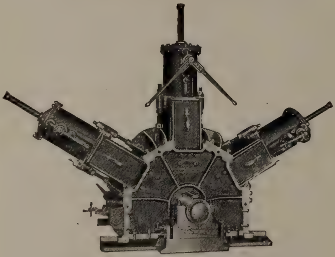

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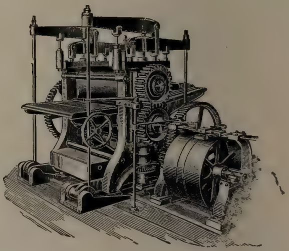

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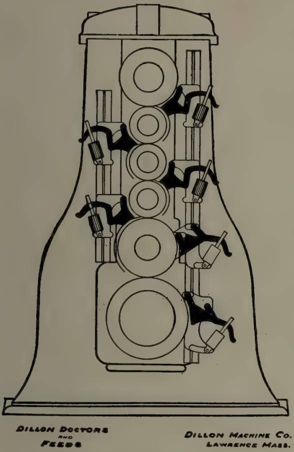

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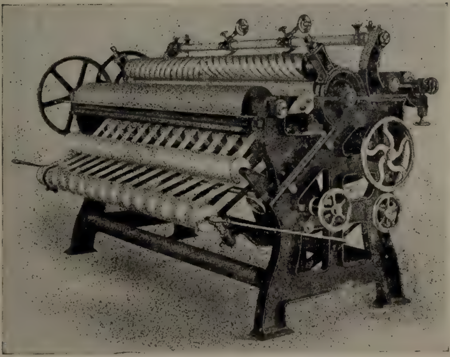

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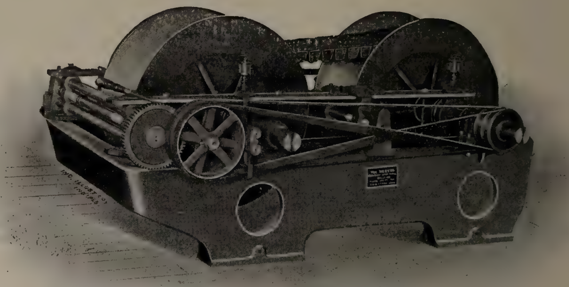

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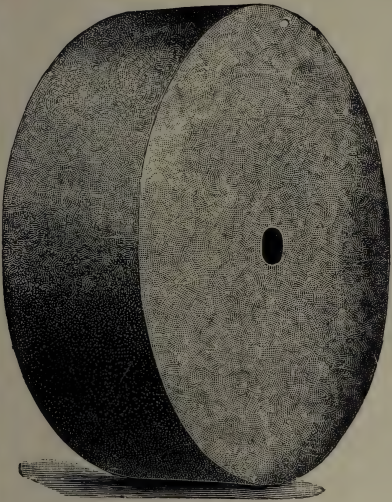

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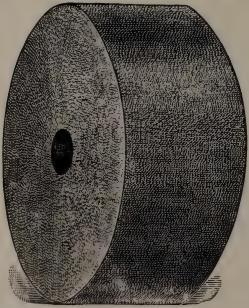

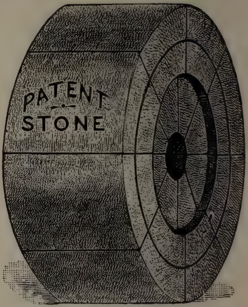

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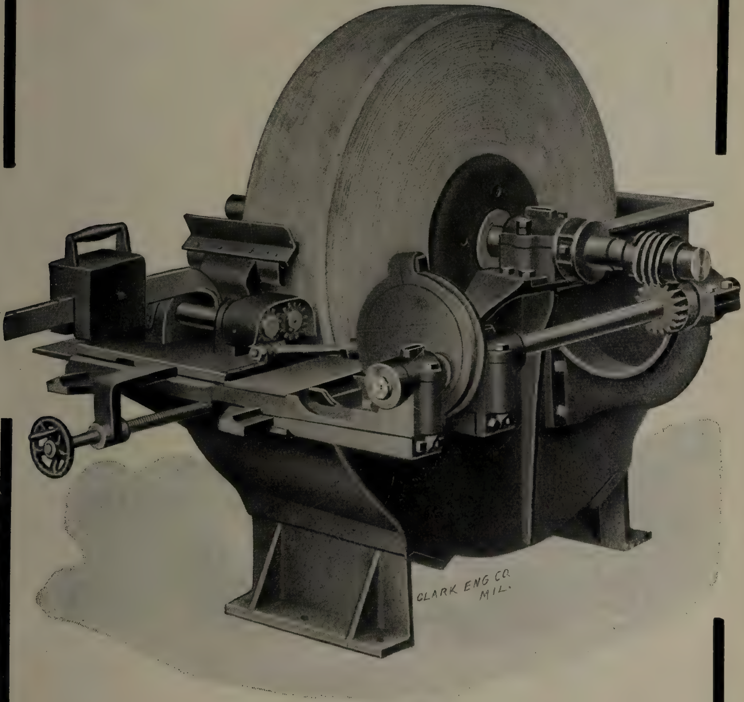

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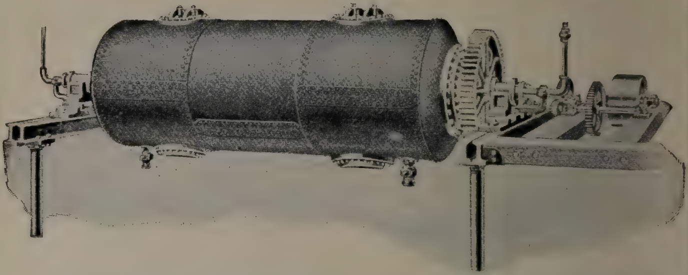

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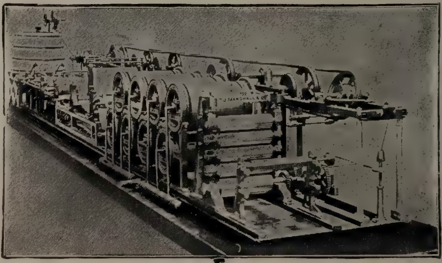

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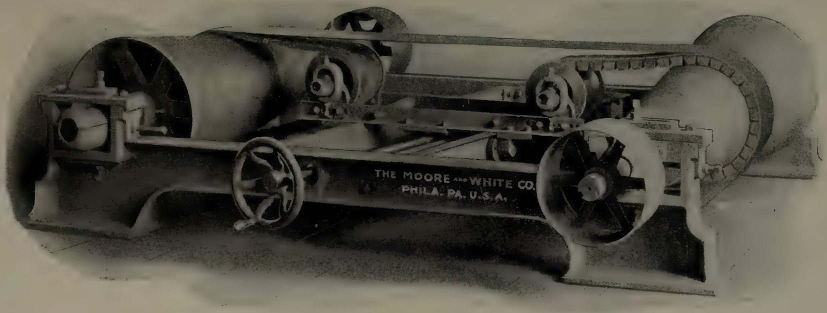

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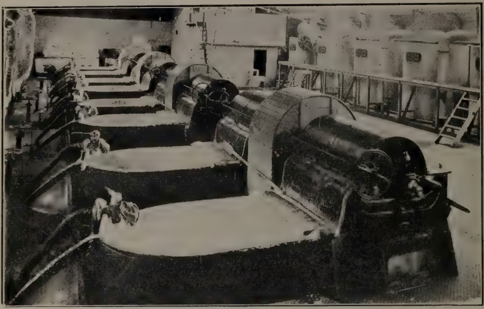

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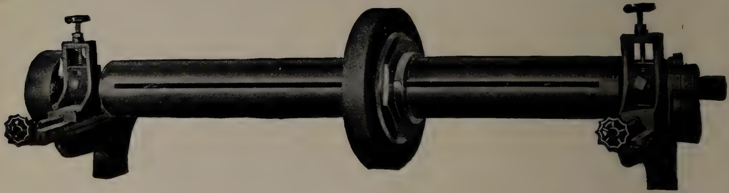

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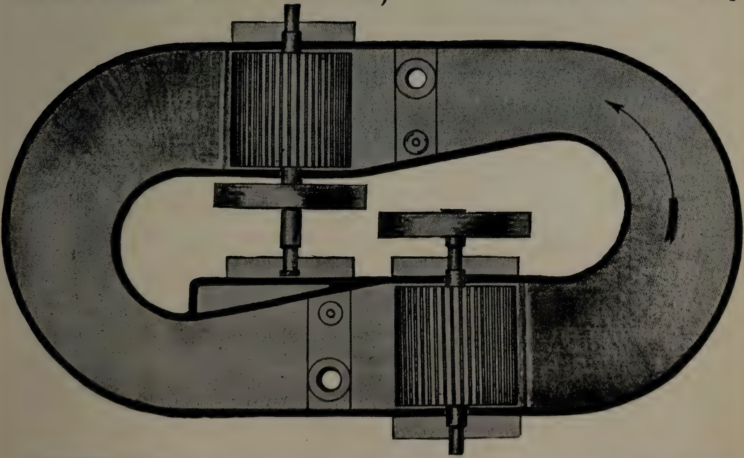

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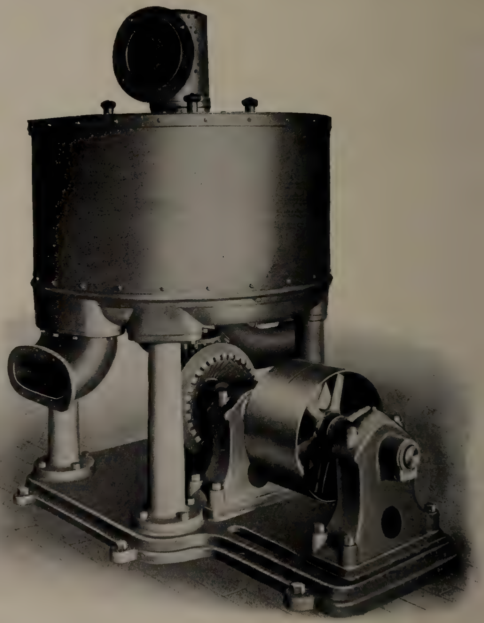

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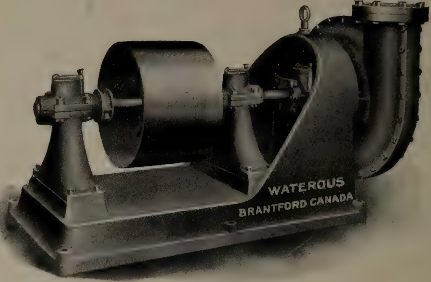

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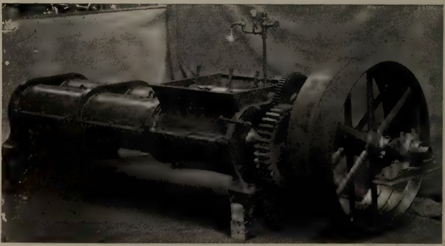

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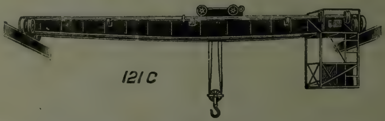

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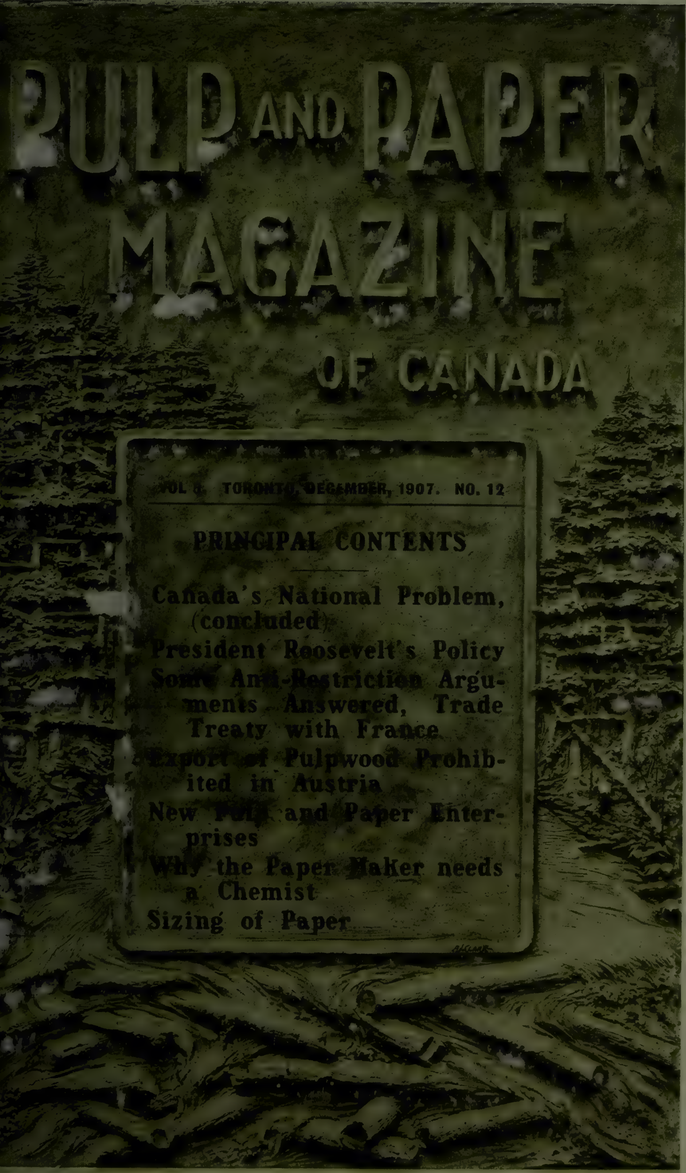

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VOL 5. TORONTO, DECEMBER, 1907. NO. 12

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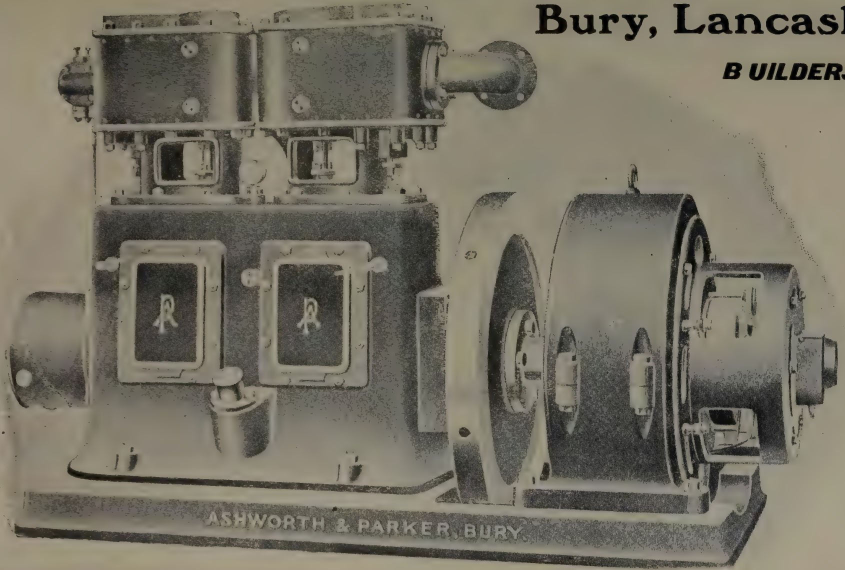

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Volumes 3 and 4 of "Chapters on Paper Making," by Clayton Beadle, are now to hand. As in the previous volumes, the work appeals strongly to the practical man, the system on which the information is given being based on answers to a series of test questions. These questions when they were first put to the workers in mills did much to stimulate enquiry, and a similar result should be traceable from a careful perusal of the work itself. In order to show the practical nature of these useful little books we quote a few of the subjects treated:

"Brass" and "Steel" Beater Bars; the Size and Speed of Beater Rolls; the Effect of Lowering the Breast Roll; Effect of "Loading" on the Transparency of Papers; the Influence of Temperature on Bleaching; Scum Spots in Paper; the Management of Suction-boxes, and many others. They are published by Crosby, Lockwood & Son, of Stationers' Hall Court, London, E.C. Prices, 5s. net.

* * *

FAWCETT, PRESTON & CO.'S DIGESTERS.

On page 13 of this issue will be seen the photo of a digester recently supplied to the Edward Partington Pulp & Paper Company, of St. John, N.B., by Fawcett, Preston & Company, Limited, proprietors of the Phoenix Foundry, 17 York Street, Liverpool, England. This firm has a large connection with the home and foreign trade, and is prepared to give prompt attention to Canadian orders. The photograph shows the digester tacked together with bolts in one of the workshops, with erection marks on the same, prior to being taken apart for shipment. The dimensions are 17 ft. 6 inches diameter by 36 ft. 8 inches long. Three other digesters of the same dimensions had previously been supplied to the same mill.

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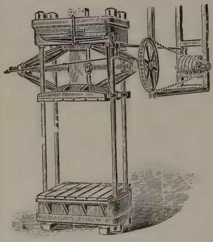
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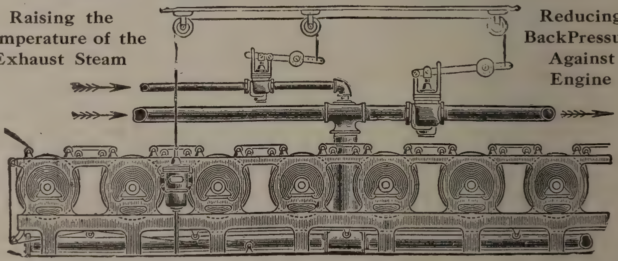

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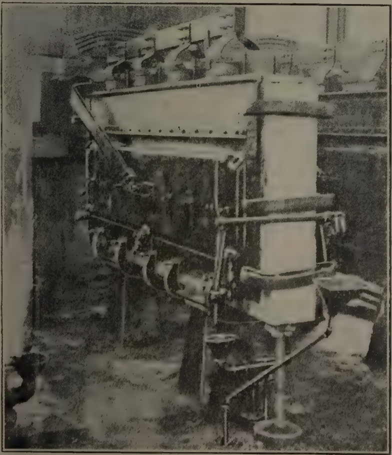

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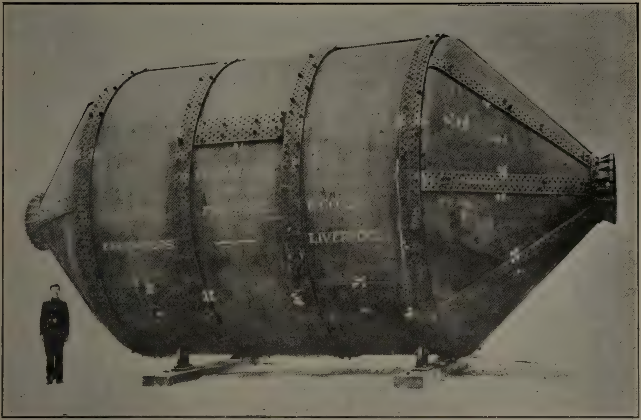

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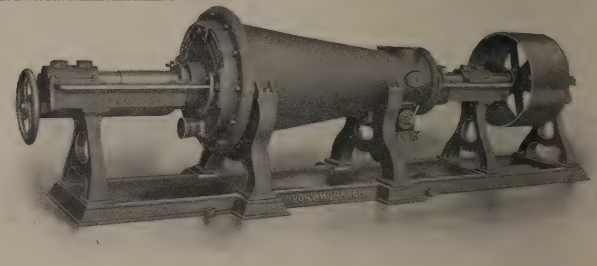

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THE
PULP AND PAPER MAGAZINE
OF CANADA

ol. 5.—No. 12. TORONTO, DECEMBER, 1907. {$1 A YEAR / SINGLE COPY 10c.

ulp and Paper Magazine

A monthly magazine devoted to the interests of Cana- an pulp and paper manufacturers and the paper trade

SUBSCRIPTIONS: Canada, British Empire and the Unit- States, $1 a year; to Foreign Countries, 5s. a year.

The Pulp and Paper Magazine is published on the ird Tuesday of each month. Changes of advertise- ents should be in the publishers' hands not later than e 10th of the month, and, where proofs are required ur days earlier. Cuts should be sent by mail, not by press.

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TORONTO, CANADA.

PRESIDENT ROOSEVELT'S POLICY.

President Roosevelt's announcement in is message to Congress that he would ecommend the placing of news paper, ood-pulp, and pulp-wood on the free ist on the understanding that this coun- ry would place no restriction on the ex- ort of pulpwood may be taken as a sop ot only to American newspaper publish- rs, but to Canadians also. It is all ery well to have the privilege of free mportation of paper into the United tates. But as for the rest of the argain, free pulp and pulpwood in ex- hange for no export duty on the latter, his really would aggravate the trouble which is looming up for Canada, the devastation of our resources for the benefit of a foreign country. There is no desire on our part to pay tit for tat in this matter, or to do anything calling for retaliation. What we need is to conserve our forest wealth to best advantage. The fact that this bears somewhat hardly on our neighbors cannot be laid to our blame. It is simply a part of a policy which they themselves now heartily wish they had adopted years ago for themselves. To obtain free access for our pulp to the United States is in itself very well. But, while we are about it, we might just as well employ a little more of our own labor, build up our own industries, and turn out the more finished product, paper. To admit both Canadian pulp free and to receive Canadian pulp-wood free of export duty is really aggravating the source of soreness—the throwing away of our natural riches, to which Canadians of nearly all classes have now become so utterly opposed. The President's announcement, in a measure, therefore, is a bone thrown to American publishers which he expects Canada to pay for. He has evidently been talking to Gifford Pinchot who has made him realize that the paper makers of the United States are obliged either to be fed with raw material from Canada, or to come to Canada to feed.

The Paper Trade Journal discussing the message, regards the proviso as to Canada's agreement not to place an export duty on wood as the best possible assurance that "the duty on pulp will not come off in a hurry, as Canadians are not likely to turn about face in their evident determination to draw our paper and pulp mills across the border into the Dominion." Of course, to a certain extent, if President Roosevelt's suggestion for free importation of Canadian pulp and paper be carried out, the desire to get as close as possible to the source of raw material might be sufficient to induce some American paper manufacturers to establish mills in Canada. But the present denudation of pulp-wood would still go on; and that is what we have to stop. The words of a prominent Maine paper manufacturer are significant in this connection:—"Should Canada prohibit the export of pulp-wood, we might be compelled to admit pulp and paper free of duty in order to protect the mills in this country dependent on Canadian wood." He adds; "But if Canada will continue to furnish us with all the wood we need free of duty, why should we not be satisfied with the tariff as it is? We cannot afford to buy wood in Canada at the present prices, plus the enormous cost of transport to our mills, and produce pulp in competition with any Canadian mills, without the protection of the tariff." No doubt, but **why** should Canada go out of the way to feed her neighbor, and herself go hungry?

A broader outlook is manifested by a writer in "Forestry and Irrigation," who says:—"It is imperative that we take care of our own trees, and not stop with coveting those of our neighbors. If we should import all of our timber supply from Canada for the next twenty-five years, and the cutting should be as wasteful as it has been in this country in the past, there would be the same conditions facing us later. It is very much to be hoped that the Canadians will not allow us to cut their timber without regulation, however eager we may be to buy it. This would be for their benefit and likewise for ours."

SCIENCE IN THE PAPER MILLS.

We would draw particular attention to the article by J. A. De Cew in this issue, entitled, "Why the Paper Maker Needs a Chemist." In every growing industry there comes a time when the need for more accuracy, for more sureness of results, begins to make itself felt. To this end, a scientific basis for practice becomes indispensable, though at the beginning, there is a Canute-like disposition on the part of the "Practical Man" to look down on theory as being of little use in every-day manufacturing life. The logic of events usually shows him his mistake in due course. One may point to Germany as a country where industrial progress has been marvellous in spite of many drawbacks, but whose disadvantages have been more than counterbalanced by the possession of the national characteristic, the scientific bent of mind. This, the spirit which wants to know the basis and why of all things done, and how to bring each process to perfection every time without a miss, is the underlying principle of the best technical education. And, if we in Canada are to compete with the older countries, our mills will have to pay more attention to this growing need of the times.

OME ARGUMENTS AGAINST RESTRICTION ANSWERED.

As an offset to the cry which is sweeping from end to end of the Dominion, or the Government to do something to revent the further throwing away of its ulp-wood riches, come questioning remarks of two prominent men who do not elieve in the remedy proposed. Senator Edwards' letter in the "Witness," and he address of Lieut.-Governor Tweedy, f New Brunswick, before the St. John Canadian Club, sound rather like voices n the wilderness of a constantly increasng opposed sentiment to their own iews. But while their respective views re, of course, worthy of full consideraion, we think they have been taken without a due appreciation of all the ircumstances. These circumstances are hat Canada possesses enormous quanties of pulp-wood in comparison with the est of the world; but that the United States, having exhausted her own is now obtaining supplies from this country in such profusion and with such wasteful methods that our own sources will also soon be on the road to exhaustion unless steps are speedily taken to prevent it.

Senator Edwards is a staunch free trader, and cannot see sense in any policy of restricting either free import or free export. And he believes the true remedy lies in the direction of conservation, at practically workable methods of body feels more strongly the need of the latter than the "Pulp and Paper Magazine." But we submit that by the time we have arrived at a satisfactory solution, and practically workable methods of meeting the present demand for pulp-wood solely from the natural increase of the forests, it will be too late, like locking the stable door after the horse has gone. If even our own pulp-wood owners would see the necessity for thus conserving this country's stores, it does not follow, judging from present appearances, that the Americans will see the matter in the same light. Therefore, we say, place an immediate check on this wholesale drain, and then set our house in order and establish a proper system for preserving what we have.

Lieut.-Governor Tweedie's argument against prohibiting the export of pulp-wood was mainly on the ground that for many years to come the Province of New Brunswick would have more pulp-wood than would be needed for use by local mills, and that there were comparatively few localities in the province where mills could profitably be established, owing, for one thing, to the scarcity of water-powers. But the Lieut.-Governor, it seems to us, forgets one of the crucial points of the case. Even if there be comparatively only a few points in New Brunswick itself where pulp mills are or are likely to be erected, what is to prevent the pulp-wood of one locality where there is no mill from being shipped to another locality where there is a mill? This is exactly what is happening to-day on too large a scale; only the pulp-wood is in Canada, and the pulp mills (largely) in the United States. If wood can be transported from Quebec to a mill in Wisconsin, it is surely just as easy to transport it from a pulp forest in one part of New Brunswick to a mill in another part of New Brunswick, or to some other place in Canada. As to the comparative absence of water-powers in New Brunswick, it may be said that while water-power is practically essential for making ground wood, for cheapness' sake, yet it is not so necessary in the manufacture of sulphite, sulphate and soda pulps, and for the production of the latter, we know no reason why New Brunswick does not possess full advantages.

THE TREATY WITH FRANCE.

Some British critics affect to believe that the new treaty which Canada has engineered with France will prejudicially affect trade between Great Britain and this country by "underbidding the Preference." We confess to failing to find signs of any such thing, except in the case of goods which are practically not made in Britain at all. In one or two cases where, in the shuffling of rates, the duty payable by France becomes less than that under the British preference, the latter will be automatically lowered. The Mother Country is favored with a reduction in duties which, taken all round, amounts to about one-third off the regular or general tariff. The reciprocal arrangement now arrived at gives an average advantage to France of 2½ per cent. off the general rate. On a comparison, therefore, between France and Britain, the latter still has, roughly speaking, a 30 per cent. advantage, which on lines in which there is any real competition, would appear to be sufficient.

There is ground for believing that the general result of the treaty should be beneficial to this country, especially in the export of dairy products, wood pulp, agricultural implements, etc. It will also likely have the effect of directing the traffic between the two countries to Canadian ports instead of going, as now, largely by way of New York. The following summary gives an idea of the articles chiefly affected in the pulp and paper trades, the second column showing the duties which will, after the ratification of the treaty two or three months hence, be payable by French imports into Canada:—

	Maximum.	Minimum.
Resinous woods in logs, per cwt.	26c.	18c.
Straw, or wool of wood, per cwt.	6.6c.	4.4c.
Cellulose pulp (wood pulp), mechanical, per cwt.	13.2c.	8.8c.
Cellulose pulp (wood pulp), chemical, per cwt.	22c.	17.7c.
Paper or card, per cwt..	$1.14	87.7c.
Cardboard, rough, in sheets, per cwt.	$1.14	87.7c.
Papier mache, per cwt...	$1.05	79c.
Cardboard, cut and shaped, for boxes, per cwt..	$1.67	$1.40
Cardboard boxes, per cwt.	$3.95	$3.16
Cardboard goods, ornamented, per cwt.	$7.90	$6.14
Linotypes, per cwt.	70c.	52.7c.
Wire gauze, copper or brass, for paper machines, per cwt., from	$5.26 to $13.16	$3.51 to $8.77

PROHIBITION IN AUSTRIA.

If the Canadian Government decides to prohibit the exportation of pulp-wood as, in view of the widespread cry to put a stop to present ruinous methods, it is quite possible at an early date, Canada will not be the first country to adopt that measure.

We understand that Austria-Hungary about three months ago prohibited the export of pulp-wood, and we have yet to learn of any neighboring nation treating such legislation as unfriendly to itself or threatening "retaliation."

PULP AND PAPER NEWS.

Senators Cox and Charlton have bought large timber areas on Alert Bay, B.C.

* * * *

G. Walter Green, of Peterboro, is said to be negotiating for the purchase of the Wm. Hamilton Mfg. Co.'s plant.

* * *

The Australian Government has repealed the duty of 10 per cent. on news paper from Canada and the United States.

* * * *

L. F. Mills, St. Stephen, N.B., has revived the North American Talc Co.'s business of developing talc deposits in Newfoundland.

* * *

The Miramichi Pulp & Paper Co, is making arrangements for putting in machinery for sawing logs and shipping lumber in a finished state.

* * *

A news item from Frost Village, near Sherbrooke, Que., states that Sears and McLeod are doing an extensive business in pulp-wood in that vicinity this winter, and it is selling at a very high figure.

* * *

The Quebec "Daily Telegraph" offices have again been destroyed by fire. The plant and building were valued at $40,000, and the insurance is $10,000.

* * *

The International Paper Co., has chartered the Norwegian steamer "Bygland," to take place of the "Fortuna," for bringing pulp-wood down from Chatham, N.B.

* * *

The steamer "St. Andrews" left Chatham, N.B., last week for Portland, Me., with a full load of rossed wood. Another steamer, the last of the season, leaves this week.

* * *

The Trade Publishing Company, Toronto, has been incorporated to take over the business of the Trader Publishing Company, Limited, and carry on a printing and publishing business.

The Crown Lithographing Company, Ottawa, has been granted a charter to carry on a wood engraving, and stationery-manufacturing business. T. R. Slee, Ottawa, and Senator H. J. Cloran, Montreal, are members.

* * *

H. H. Everard, of the Detroit Sulphite Fibre Company, has purchased for that company 70,000 acres of spruce limits north of Lake Superior. There is said to be on the property enough timber to last the company fifteen years.

* * *

Prof. Fernow, Dean of the new Faculty of Forestry in Toronto University, has already started work in a practical shape. He has had several fine trees planted in the ravine behind McMaster University, and has arranged for a large number more.

* * *

J. R. Booth, of Ottawa, is a "practical" prohibitionist. He has offered to give the council $2,000 as a recompense for any revenue the city might lose for withholding licenses next year from three or four premises where liquor is now sold in the neighborhood of his mills at the Chaudiere.

* * *

The schooner "Venita," loaded with sulphur from the Union Sulphur Company, New York, consigned to the St. John Pulp & Paper Co., Mispec, N.B., sank last month off Eastern Point. The crew were saved after a terrible experience in an open boat.

* * *

The Radcliffe Lumber Company, of Duluth, Minn., which holds a billion and a half feet of timber on Vancouver Island, makes no secret of its intention to do business in Canada on a large scale just as soon as its holdings on the American side are exhausted. It plans to build within a year or two a gigantic sawmill on its Canadian property, and to transfer its offices to Victoria, B.C., shortly.

W. H. Rowley, president of the E. B. Eddy Co., Hull, made a strong plea for the imposition of a substantial export duty on pulp-wood, at a dinner given on the 7th inst., to the executive of the Canadian Manufacturers' Association at the Laurentian Club, Ottawa.

* * * *

The Dominion Tag, Label and Ticket Co., Montreal, has been incorporated to engage in printing, lithographing, bookbinding, to manufacture, and deal in paper boxes, tags, labels, and stationery. R. E. Treen, printer, and F. N. Seddall, importer, Montreal, are members of the company.

* * *

The actions brought by the Gillies Bros. Lumber Company, against the Toronto and Northern Ontario Railway Commission for losses through fire started by locomotive engines were dismissed, though the Commission was found guilty of negligence in allowing brush and chips to accumulate along the right of way.

* * *

The trial of the six Buckingham strikers, accused of manslaughter in connection with the riots at the McLaren Pulp Mills last year, during which a private detective and two employees of the company were killed, has been concluded at Hull. Judge Talbot found the charge of manslaughter not proven, but on the charge of rioting the accused were sentenced to two months in jail.

* * *

The Toronto Paper Co. has appealed from the judgment granted last October to pay Garlough, an employee who was seriously injured by a quantity of boiling pulp being let loose while he was turning on the water in the drainers. They claim that plaintiff undertook the risk, which was well known to him, and that the injury was caused by his own negligence.

* * *

W. L. Davis, and J. N. Joyce, of the Dells Paper Pulp Co., Eau Claire, Wis., have been on a long visit to New Brunswick, Nova Scotia, and Newfoundland, with a view of looking over timber lands there. They expressed the opinion that, with the prospect for the prohibition of pulp-wood export, some additional pulp mills are likely to be built in Canada.

* * * *

J. Holliday, who owns a line of steamers operating along the north shore of the St. Lawrence, says the pulp-wood industry is gradually superseding the fisheries on the northern Gulf shore. Most of the accessible spruce limits, he says, have been taken between Quebec and Blanc Sablon on the Labrador coast. At Pentecost, United States capitalists are engaged largely in the pulp industry, exporting in steam barges to a distributing port in the Great Lakes.

* * *

We learn with deep regret of the sudden death of John Christie, the well known agent for Eastern pulp mills, which took place through heart failure. He was formerly connected with the Napanee Paper Co., but in recent years has been an extensive traveller in his capacity of pulp broker. Mr. Christie was 51 years old, and will be missed by a large number of pulp and paper men, among whom he was very popular. The business will be carried on in future under the name of the John Christie Co., Toronto.

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Considerable trouble has been caused as a result of recent trials of hand loggers for alleged stealing of lumber off leased British Columbia pulp lands. For six or seven years during which the pulp leases have been effective it has been generally thought that the position of the holders of the leases with respect to the timber covered by them was impregnable, and no attempt was ever made by loggers to actively take logs off the leaseholds. Save in one instance, none of the pulp companies have yet commenced the erection of pulp mills, and the timber on the reserves has been tied up. As a consequence of information regarding the leases gathered during one of the recent trials, a search of the leases was made with the result that the handloggers have been advised that under their licenses they have a right to log on these lands.

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The Dominion Deputy-Minister of Railways has this to say about one of the difficulties met with by the Intercolonial:—"A feature of traffic which entails much difficulty with the Intercolonial rolling stock is the retention of its freight cars for prolonged periods, on United States lines. Once sent across the boundary line, they are held and utilized by other roads, and their recovery is a matter of difficulty, this notably the case with pulp-wood, of which, during the nine months ended on March 31st, 1907, there was shipped over the Intercolonial Railway to United States points 94,125 tons in 4,968 cars. For this there appears to be no redress and, until the manufacture of raw material is more general in Canada than at present, it may be expected to continue. This is an argument for legislation which will compel the manufacture of pulp in this country.

NEWS OF THE MILLS.

Davy's pulp mill at Thorold, Ont., has shut down for a few days for repairs.

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The Don Paper Mills, east of Toronto, have been purchased by Robert Davies and are being renovated.

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The Lake Megantic, Que., Pulp Co., have closed their sawmill for the winter. The cut this season has been exceptionally heavy.

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Daniel Macdougall is putting in a rossing plant at Tide Head, in the Restigouche district, N.B., with a capacity of 20 cords per day.

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W. McGouey, a teamster employed by the Inglewood Pulp and Paper Co., Musquash, N.B., was killed instantly by a falling tree.

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J. Brooks Beveridge, formerly of the Miramichi Pulp & Paper Co., Chatham, N.B., has taken a position with the Canada Paper Co., at Windsor Mills, Que.

* * *

H. W. Schofield, of the Edward Partington Pulp & Paper Co., St. John, N.B., leaves this month for England on a business trip, and expects to return to Canada in January.

R. Bradley, employed by the Riordon Paper Mills, Merritton, Ont., was injured while at work last month.

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Edward Finlay, who for many years was superintendent of the Georgetown Paper Mills, has been appointed superintendent of the Canada Paper Mills at Windsor Mills, Que.

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The Dominion Pulp Mill, Chatham, N.B., has started up again with a full force of hands, and everything is running smoothly. H. G. Stephens is the new manager.

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The employees of the Lincoln Paper Mills, Merritton, Ont., were given a holiday on the 14th ult., as a mark of respect to the late president, John Conlon, in order that they might attend his funeral.

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T. C. Paton, of Montreal, T. E. McKee, of Sturgeon Falls, and several others interested, waited on the Ontario Government last month and asked it to take steps to protect the unsecured creditors of the Imperial Paper Co. They contended that as the Government is the owner of the pulpwood areas leased to the company, it is in a position to look after their interests in the event of any transfer.

The Riordon Paper Mills Co., appealed against a judgment ordering it to pay $3,500 for the death of J. E. Cameron through the alleged non-protection of certain machinery, but the appeal was disallowed.

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H. Underwood, general manager of the International Paper Co., and H. J. Chisholm, chairman of the directors, visited the Hutchison mill property at Douglastown, N.B., recently, relative to the site for a rossing mill.

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F. H. Mortenson, manager of the Brompton Pulp and Paper Co., Bromptonville, Que., has been lately in the Sherbrooke Protestant Hospital undergoing treatment for a severe attack of rheumatism.

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A dam is to be built above the "Big" Chaudiere greatly increasing the head of water below. As this is expected to furnish a regular flow throughout the year, it will be a great boon to the pulp and paper manufacturers on both sides of the river.

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A. E. Millington, manager of the Spanish River Pulp & Paper Company, Espanola, Ont., and his wife, have been annoyed by receiving certain "Black-Hand" letters, and now J. McLeod, a well-known citizen of Sault Ste. Marie, has been arrested on a charge of having written them.

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The Canada Coating Mills, Georgetown, Ont., are running at full capacity. They added another single coating machine last month. Orders are keeping up fairly well, and the prospects for business in January are very good.

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At the Miramichi Lumber Co.'s mill at Chatham, N.B., sixteen rossing machines are being put in, and the band saws will hereafter only be used to cut dimension stuff. The Richards Mills will be fitted up with barking machines in the spring. This company is getting out a large quantity of logs this season.

The Spanish River Pulp and Paper Company, Espanola, Ont., has experienced trouble through lack of sufficient water to permit its drives coming down, and though it is trying to get wood from other sources, it may have to shut down for several weeks. This makes a serious outlook for Wisconsin paper mills, as the Spanish River Mills, it is estimated, produce pulp for 30 per cent. of the paper production of the West. Latest report speaks of snow having arrived, and the mill is now running again.

THE CHRISTMAS GLOBE.

The Christmas number of the Toronto "Globe" is as usual an excellent one, and one of the features which greatly assist in this general make-up of excellence is the paper on which it is printed. It was made by the Canada Coating Mills, Limited, Georgetown, Ont., a company which does so much to keep up the reputation of Canadian manufacturers for the production of fine goods. Another feature of this year's Christmas Globe which is worth noting, is the short story by Wm. Banks, Jr. It was Mr. Banks, it will be remembered, who wrote the "Globe's" recent series of articles on the Pulpwood Situation.

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—The British Columbia Timber and Forestry Chamber of Commerce, Vancouver, is organizing a branch chamber in Victoria. Judson F. Clark, formerly president of the Canadian Forestry Association, is secretary.

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—We are pleased to be able to state that the pamphlet entitled "Canada's Approaching Peril," setting forth the reasons why the exportation of pulpwood should be prohibited, has met with such a cordial reception that another edition has been arranged for. It can be obtained from Biggar-Wilson, Limited, Confederation Life Building, Toronto. Price, 5c. for single copies, or $2 per hundred.

NEW PULP AND PAPER ENTERPRISES.

J. F. Patten, the London representative of J. R. Booth, Ottawa, is on a visit to New York looking into conditions in the news market.

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F. G. Coarson, of Colebrook, N.H., and other American capitalists have acquired the Thibaudeau limits on the Grand Cascapedia River, and will build large lumber and rossing mills at Lynd's Cove.

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Port Arthur, Ont., city council, is negotiating with capitalists, whose names so far we have been unable to ascertain, with a view to the erection of pulp and paper mills in that vicinity, with a capacity of 50 tons of paper daily.

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R. H. Reid, R. S. Elliott, and J. W. O'Brien, and other New York capitalists represented by W. L. Bowker, engineer, New York, have acquired for about $3,500,000, some 500 square miles of limits near Hawkes Bay, Newfoundland, and the intention is to establish next spring several large pulp mills on the property.

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L. O. Armstrong, Colonization Agent of the C.P.R., has been taking representatives of a wealthy Chicago syndicate through the forest lands north of Lake Superior. The intention is to build large pulp mills. Mr. Armstrong is of opinion that the placing of an export duty on Canadian pulp-wood will further stimulate American pulp manufacturers to locate in Canada, but he states that the above-named will do so, whether such a duty is imposed or not.

H. A. Mellon & J. Kolts, Vancouver, have secured 88 acres of land on the mainland at Howe Sound, and on behalf of a local syndicate will, it is said, erect some large pulp mills on a site covering 11 acres, to employ 400 men. A high grade of paper is to be produced, and under the patent processes which will be used, all kinds of timber except maple, will be utilized. The company is capitalized at $1,000,000. It will largely utilize sawmill waste, and will manufacture news-paper, boards, building paper, as well as paper of high grade. Present plans call for a plant to turn out 200 tons news, and 160 tons manila, boards, building paper, etc. The product will largely be exported to the Western States and to Australia. Mr. Kolts' address is 313 Cordova Street, Vancouver.

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The Newfoundland Pulp & Timber Territories, Ltd., has been registered in London, with a capital of £750,000, with the object of acquiring for £600,000 from Alex. Campbell, certain concessions in Newfoundland, and carrying on business as timber and pulp and paper merchants. The signatories to the memorandum of association are:—F. S. Wilks, Ashlyns, Watford; H. B. Blower, 20, Mount Ephraim Road, Streatham; C. C. Brown, 199, Piccadilly, W.; A. C. Blackwell, 16, Flaxman Road, Loughborough Junction, S.E.; J. A. Campbell, 3, Manor-villas, Finchley, N.; T. H. Cothill, 17, Linkenholt Mansions, Hammersmith, W.; R. E. Henry, 50, Somerleyton Road, Brixton, S.W. (one share each). The company's solicitors are Cox & Lafone, 17 Tower Royal, Cannon Street, London, E.C.

—We have received a copy of the Illustrated Winnipeg Statistical Calendar for 1908. The statistics, compiled for ready reference, give an accurate statement of the growth and prosperity of this industrial and commercial centre of the Canadian West.

—The annual convention of the Cellstuff and Paper Chemists' Association was held in Berlin, Germany, on the 9th and 10th inst., when several interesting papers were read. A. D. Little, of Boston, Mass., represented American interests.

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A NATIONAL PROBLEM.

From the Quebec Standpoint.

The Province of Quebec is a marvel among the countries of the western hemisphere in respect of its water powers and its forests. So far as geographical discoveries have disclosed, no region of the earth is possessed of water-powers so numerous and on such a colossal scale. Hundreds of these powers are yet unutilized, and many rivers, known, from the elevations they traverse, to contain large water-powers, are still unexplored by white men. In northern and eastern Quebec, and accessible to many of these rivers, are vast stretches of timber land, specially adapted to the production of pulp, and the province is peopled by a race of men who cannot be equalled for their skill in wood craft. As ample water supply is an essential to the manufacture of mechanical wood pulp, here is a combination of circumstances which ought to make Quebec the greatest pulp and paper manufacturing country in the world. To realize this great distinction, it is only necessary that the people of the province should first understand the facts and then have the patience and determination to move towards their destiny.

It will be shown in this pamphlet that the benefits created by a pulp and paper industry within our own borders are from ten to a hundred times greater than those arising from the sale of pulpwood for export, and if the export of pulp-wood is prohibited and foreigners are compelled to manufacture here, it will be but a short time before these benefits are realized in the development of this country, simply because the presses of the United States and other countries must have their supplies, and if these are not available at home, they must be obtained in Canada, or in other pulp producing countries. If, with the intention of retaliating, the United States should obtain its supplies of pulp from Scandinavia, then the absorption of the extra supply from Scandinavia would take that much out of the British and European markets and by raising the price there, so open the British and European markets to Canadian pulp. There is no doubt that the world's supply of raw material for pulp and paper is diminishing, not increasing, and the fact that American mills are each year becoming more and more dependent on Canada for the supplies of pulpwood which their own depleted forests can no longer furnish, puts it out of the power of that country effectively to retaliate against Canada for any new policy we may adopt to protect our own interests. The United States is not likely to attempt any such retaliation. There is no measure that country could take which would not work a greater injury to itself than to Canada. The simple fact that Canada buys twice as much from the United States as the United States does from Canada (the exact figures for 1906 being $97,806,552 of exports to the United States, and $175,862,071 of imports from the United States, largely manufactured goods), shows who would suffer most from tariff recrimination.

It is in the power of the Dominion, but not of the Provincial, Government to prohibit such exports.

The policy of holding our own pulpwood, and with this raw material building up a Canadian pulp and paper industry, is not only safe in a political sense, but it is the only thing we can do for self-preservation and the maintenance of the resources which God has entrusted to the keeping of the Canadian people.

To all the other provinces, the preservation of the forests is one of the great questions the present generation has to deal with, but to Quebec it is the problem of all problems. When the present accessible supplies of timber are exhausted to supply American mills, it will cost the province millions more than the present income from pulpwood to build railways to get supplies from regions beyond, so that the selling of our present stock of available pulpwood for the mere price of the raw material only puts further away the chance of building up the home industry. If the people really understand the situation and are determined to create the industry for which nature has given the province such unique facilities in raw material, cheap power and reliable labor supply, men now grown to manhood will be still living when Quebec will be supplying pulp or paper, or both, to half the world. With such an industry established and furnishing ever increasing employment in skilled labor, we should no longer complain that the sons of Quebec have to seek in the United States the opportunities of life now denied them at home.

That the policy of building up a home pulp and paper industry would be better from every aspect, than exporting raw pulpwood, must be evident from the history of the trade for the past four years. In 1903, the average price of spruce wood "in the rough" delivered at Quebec stations for export was $3 to $3.50 per cord; at the present time, it is $6 to $7 a cord in the Eastern Townships, while rossed wood is from $8 to $10 a cord in the same localities. Calculating the total Quebec exports of this year at 500,000 cords, the province has thus lost over $2,000,000 on the dealings of a single year. Had the export of pulpwood been prohibited in 1903, and had only the amount exported since then been made into pulp and paper, the province would to-day be better off by several millions of dollars, while profitable employment would have been had for thousands of our citizens who have had to go away for want of work at home. Meanwhile, the price of the pulpwood sold to the Canadian mills, being regulated ultimately by the world's demand for paper and pulp, would have been as good as if exported. By a wise regulation of the cutting of wood and a rational treatment of our forests, the pulp and paper industry of Quebec would by to-day have been so far advanced that the foundations would have been laid for an export trade which no other country could take from us, simply because the natural conditions for the maintenance of this industry are overwhelmingly in our favor.

But these considerations are not the most serious features of the alternative now before the people of the province. It is known that the spring floods in the Eastern Townships which each decade are becoming more disastrous in sweeping away bridges, etc., and in damage to land, are caused by stripping the forests away from the land around the sources of the streams, and the drying up of many of the small streams, once perennially flowing, is due to the same cause. Further, the increase, in recent years, of summer droughts is no doubt due to the like cause, and such changes developed over a larger area of the great valley of the St. Lawrence will reduce the productivity of the farms and will especially damage the dairy and cattle raising industries which now form the mainstay of the province's agricultural population. The bare possibility of such a wholesale impoverishment of the resources of the province is appalling, and the people of Quebec may well ask themselves:—"Are the few dollars derived now from the sale of pulpwood any compensation for the destruction of resources so vital to the future well-being of the land?" Has the present generation any right to sell away for such paltry consideration that which is necessary for the very existence of their children? Have we any right to bequeath an inheritance of poverty where nature has given the opportunity for profitable industry and the increased comfort of a numerous people? The French-Canadian with his love of children and his strong family affections will be the last man on earth to calmly contemplate such a future for his people, but the indiscriminate wiping out of the forest for the mere purpose of selling pulpwood, without the creation of a pulp and paper industry, and without regard to the effect on climate, rainfall and water-powers, is national suicide. It is, therefore, the duty of every Canadian who would make his country more prosperous and powerful to see that the forest is so scientifically treated that it will be a perpetual blessing, so that it may shelter and maintain the millions of posterity as it sheltered and nourished the little band of pioneers who first made their homes on the banks of the St. Lawrence.

—Carl Riordon, chairman of the Pulp and Paper Section of the Canadian Manufacturers' Association, in forwarding to the Ottawa Government a summary of the contentions of the manufacturers in regard to restricting the present ruinous exportation of Canadian pulp-wood, made the following pertinent remarks as to any alleged loss that would accrue therefrom to Quebec farmers:—"If the exportation of pulp-wood were stopped the farmer would have to find a different market for his wood which now amounts to about 300,000 cords per year. Our firm would be willing to buy its whole requirements of say 100,000 cords per year at say $9 delivered at our Hawkesbury mill, and $12 delivered at our Merritton mill, provided we dealt directly with the farmer, which would give him fully as good a price as he gets at present. If this were to be decided on now, to take effect some time next summer, which would allow of the present cut being exported so as to make the least possible hardship to present consumers, it is very probable that a considerable number of new mills would be in operation in time to buy and use the cut of next winter 1908-1909, and then the farmer could well afford to conserve his wood so that he would not have to strip the land, and to sell instead of his farm produce and his labor. As it is now whole districts are being stripped and left impoverished with very little means of livelihood for the inhabitants."

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—The Williams Gray Co., of Chicago, Ill., have been appointed manufacturers and sole agents in the United States for the Moreau Barking Machine. The headquarters of the Moreau Barking Machine Company are now in St. Hyacinthe, Que., where the company is well equipped to look after its largely increasing business. European patents have also been disposed of to well-known manufacturing firms.

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—Several of the cheaper daily and weekly newspapers in the United States have been forced, owing to the high cost of paper, to increase their subscription price by 50 to 100 per cent. The special weekly editions of "La Presse" and "La Patrie," Montreal, have had to do the same thing, and have increased their prices from 1 to 2c. per copy.

WHY THE PAPER MAKER NEEDS A CHEMIST.

(Written for the "Pulp and Paper Magazine" of Canada.)

By J. A. De Cew, Montreal.

To anyone familiar with the process of paper manufacture, the above subject of discussion may possibly be of interest, because to the paper maker it is a question which comes to the front from time to time.

The actual value of the chemist in this branch of manufacture is as yet one subject upon which many good paper makers differ. We say this because there are many good paper makers, who carry on their work without the direct assistance of a chemist, and who are quite satisfied with the results that they are getting.

It is to these manufacturers that we submit the present argument in behalf of the chemist, because those manufacturers who maintain their own laboratory have already been convinced of the value of the chemist's work to them, and have many reasons for retaining him in their service.

In order to bring out one essential point in this connection, let us ask ourselves the question, If the managing director or superintendent of a paper mill were himself an experienced chemist, would he then have any use for chemical workers? The reply to this would undoubtedly be that the technical superintendent, himself being fully conversant with the chemical problems arising from his work, but being fully occupied with other responsibilities, would require a number of workers to carry out the control tests and material tests that he would establish. Moreover, the exactness of his mill work, resulting from his particular knowledge of all his materials, the standards of quality which he always knows, eliminates to a large extent the accidental losses which so often occur.

In a paper mill, things often go wrong, and it is not the fault of the superintendent. The difficulty is never explained, but a large amount of paper has been spoiled. Perhaps for some unaccountable reason the paper is not sized to any extent, and being made on a special order, it is of very little use elsewhere and is sold at a heavy loss. Perhaps a short time after being made, the paper loses its strength and becomes brittle, the result of certain chemical residues. Again, the tinting or coloring is not as expected, owing to the decomposition of the ultramarine in the beater, or an alteration of the strength of the dyes that are used.

The unfortunate part of it all, is that the superintendent gets the blame for all these accidents and losses, when in reality he has no facilities for guarding against them. In spite of this fact, however, an occasional superintendent is of an infringement upon his rights, in-
of an infringent upon his rights, instead of a helpmate whose work is really an insurance of his reputation as a successful paper maker.

Let us now present another side of the question. After having passed through a period of hard luck in which a lot of more or less unsatisfactory paper has been made, the paper maker decides that it is cheaper for him to pay a fancy price for his chemicals and other materials and be assured of steady values, rather than to take any further blame for spoiling his paper.

He finds a satisfactory line of ingredients, and determines to use them regardless of price, and in this way all competition is eliminated, which, of course, makes his cost of manufacture high.

While he is doing business in this way, he still has to compete in his selling price, as against that maker who buys his materials in the cheapest market for value, and at the same time is certain of what he is getting.

The latter is a paper maker who gets efficiency with the lowest cost of production, and is really the best servant of his stockholders, because he realizes that paper mills are not only built for the purpose of making good paper, but also for the purpose of making money.

Another aspect of the question is the one of progress. Methods of manufacture are continually being improved while new economies are being effected, and it is only by keeping in close touch with the developments that are going on, that the paper maker can stay in the race.

It should be a part of the work of the paper chemist to place before his employers, the commercial side of all new developments in the technology of paper making, and this information will have its influence upon the general management of the entire plant.

In the hope that the above argument will justify the claims for the commercial existence of the paper mill chemist, we have yet to face the question of first cost to the paper mill that establishes a department of this kind.

The equipment of a commercial laboratory would cost at least from $500 to $1,000, and if a man without previous experience in this work were placed in charge, it would require at least a year before he would gain the experience necessary to obtain the best results. It is on account of this fact that many mill managers believe that they cannot afford the extra expense of this department.

If a number of such mills were consolidated under one management, so that each would share in the benefits of work of this kind, the technical department would, no doubt, be established at once. Under present conditions, however, the only way that such a service can be economically rendered, would be by the establishment of an independent technical bureau, which could offer to all of its clients the sum of its experience at a relatively small cost to each individual.

Without some such means of keeping control of the otherwise uncertain purchase values, and also of having the advantages, or otherwise, of new processes and improvements, the smaller mill is at a great disadvantage as compared with its larger competitors.

There is a reason for this which may be stated concisely as follows:—Progress is generally the result of experiment and tests, and the cheapest place to make tests is in the laboratory rather than the mill.

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BRITISH WOOD PULP ASSOCIATION.

The eleventh annual general meeting and banquet of the British Wood Pulp Association were held in Manchester on the 14th ult.; Capt. Edward Partington in the chair. The committee on testing pulp for weight recommended that the wedge system of cutting samples be adopted, the wedges or triangles to be drawn from the centre to the outside, with base angles of 22½ degrees, or 11¼ degrees, according to size of parcel. The "Amended Contract Note" came up for considerable discussion, and the committee which had been appointed to deal with the subject presented its report, and made recommendations, but final settlement was left over for a time. Capt. Partington was re-elected president; F. Lloyd, A. E. Reed, C. T. Owen, W. G. Taylor, C. T. Craig, L. P. Andrews, H. B. Wood, J. Y. Henderson, and J. A. Nordberg, vice-presidents, and C. D'Oyley Mears, secretary.

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—The Philip Carey Mfg. Company, manufacturers of cement roofings, etc., Lockland, Cincinnati, who also have a large factory at Hamilton, Ont., send us a copy of their illustrated catalogue, which gives in a very neat way full information about the goods they deal in,—85 per cent. carbonate of magnesia, asbestos and other pipe coverings, roofing paints, cements, steam packings, etc., etc.

NEW TYPE OF JORDAN ENGINE.

On page 59 of this issue will be found the illustration of the new Vertical Jordan, the joint invention of Arthur Jones, millwright, and Arthur Gregg, superintendent of the Illinois Straw Product's Company's mill at Rock Falls, Ill., U.S.A. Speaking of the invention a recent issue of the Paper Trade Journal says:—

" The new machine revolutionizes all accepted theories and traditions of Jordan construction, but in the practical operation under the most exacting conditions it is fulfilling the claims of the inventors.

The engine, it will be observed from the illustration, stands on iron legs fastened to a bed plate. Immediately underneath the cone is the driving gear, the position of which is controlled through a worm and hand wheel for raising and lowering the plug. Both shell and plug are unique in construction, being of cast iron, with steel knives cast in when each is cast in the mould. Both are afterwards turned in a lathe to make them absolutely true, thus guaranteeing the same effectiveness in operation when the knives are new as when the knives have been run.

The shell sections are securely bolted together, and can be readily taken apart when refilling is necessary. Refilling is the simple operation of substituting a new plug, and can be done in half a day, an obvious economy over the older method, whereby the engine is out of commission for two or three days. A new plug lasts practically a year. It will be seen, therefore, that the cost of repairs is reduced to a minimum. The long life of the knives is secured through the vertical construction, as it at once removes the principal cause of wear, namely, the weight of the plug, and the down pull of the belt. For the same reason a great saving in power is effected.

Not only is much of the power consumed in the operation of the horizontal Jordan lost through the weight of the plug and the down pull of the belt, but the grinding efficiency is considerably reduced thereby. This is apparent when the shell is opened for repairs. The top knives are frequently found in perfect condition, while the lower knives of the shell are ground away. The effect of this upon the stuff is obvious. The vertical machine necessarily insures perfect grinding at every point of contact, and affords an even run of stock at all times. On account of the evenness of the load the maximum speed can be maintained at all times, an 8-inch belt over a 12-inch pulley affording ample power. The feed is from the top through a revolving screen keyed on to the top end of the Jordan shaft. The desirability of the screen is obvious. For certain kinds of stock it is almost a necessity.

No small percentage of repair cost and of defective stuff is attributable to the presence of iron and wood in the Jordan. Briefly put, the advantages which the inventors claim for the new machine, are, as follows:

That is requires but half the power used in the old type engine; that half the space suffices; that it costs less than one-half for annual repairs; that it can be refilled in a few hours; that through the even flow of the stuff and the perfect grinding contact at all points it furnishes uniform stuff at all times, and that it will handle twice as much stuff as the older type of machine.

While the new type runs counter to the established form of Jordan engines it is certain that some remarkable results are being obtained from the machine in practical operation.

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—Hon. J. D. Rolland spoke at the recent banquet of the Peterboro Board of trade, strongly in favor of Canada keeping her own forests. Our lakes and rivers, he said, would only exist until their banks were denuded of forest growth.

AN ACID-PROOF LINING FOR SULPHITE PULP DIGESTERS.

In a recent issue we published an article on lining of sulphite boilers, in which article we referred to the report of a German paper on a lining said to be composed of Portland or Roman cement and water glass, with an admixture of straw cuttings. Our attention has been now called to the fact that we have right here in our country a real acid-proof lining for sulphite pulp digesters, as provided and verified by nearly ten years' use in some of our mills. This lining is now very largely in use in pulp mills in the United States, and is known as the "Panzl" lining. It is made of a composition invented by Mr. Panzl, wherein the combination of hydraulic cement and silicate of soda has been for the first time successfully accomplished to effect chemically the conversion of the lime materials, used in compounding the lining, into a truly acid-proof substance, This composition contains, besides cement and silicate of soda, the other ingredients necessary for the chemical process whereby **all** of the ingredients are converted into a chemically homogeneous substance, possessing the requisite qualities.

Sulphite pulp mill men well remember the disappointment when the expectations as to the efficacy of the so-called cement-linings were not realized, practical experience showing that sulphite of lime **does** dissolve hydraulic cement and such cement mortars as were then proposed and used for lining of digesters. The Maritime Sulphite Fibre Co., one of the many who have suffered from this disappointment, had digesters lined with such cement lining and they were in as despairing condition toward the end of 1896, as so many others. One of their chemists then brought to the attention of the managing-director, that while he was in Hallein, Austria, he became acquainted with Mr. Panzl, there employed by Ritter Von Kellner, as expert on lining of digesters for their sulphite mills. Upon this suggestion, Mr. Panzl was sent for and he installed, experimentally, in their No. 5 digester a lining of his composition only three inches thick. The quality of this lining was tested by Mr. Stuart, the managing director of the mill. In his letter of October 14th, 1901, that is something over four years after this "experimental" installation, Mr. Stuart said:—

"The digester is being used continuously. We found the composition very compact and durable, the digester being tight ever since."

We have not at the time of writing this article ascertained whether the lining is still in use, but we are led to believe that it is and we also understand that the other digesters of the Maritime Sulphite Fibre Co., mills were lined with this composition, and are being operated with equally satisfactory results.

The same lining was installed by Mr. Panzl in the digesters of the Laurentide Paper Co., at Grande Mere, P.Q., and their experience is expressed in a letter, written some years afterwards, wherein the superintendent of the mill states:—

"Our digesters have been in operation now for about four and one-half years with the Panzl lining, and have not given us any trouble at all. I consider it the very best lining and highly recommend the same."

Later on the superintendent wrote in response to an inquiry from another mill:—

"The digesters lined with the Panzl composition have now been over five years in use. We have not yet had any trouble with the lining, and I am firmly convinced that our digesters are the best lined ones that I have ever seen."

In the pulp mill of the Lake Superior Consolidated Company at Sault Ste. Marie, Mich., two new digesters, installed in 1900, 17 x 54, were lined with the Panzl composition and the lining has proved entirely satisfactory in every respect as means of safely and **permanently** protecting the metallic shell of the digesters. Mr. Michaelis, the superintendent of the mill, reported that the digesters were operated as long as he had charge of the mill (for over three years) almost continuously, and that when he left there the linings were in very good and very satisfactory condition. He stated that he recommended the Panzl lining to be installed in the digesters, having satisfied himself that the lining is the best, most safe, and the most durable, being practically indestructible.

This Panzl lining is also in use in the Riordon mills at Hawkesbury and Merritton, and in several other Canadian mills, and is now very largely in use in sulphite pulp mills in the United States.

The crucial point in the test of a lining is its capacity to resist the action of sulphuric acid liquor employed in digesting pulp. While the combination of hydraulic cement with silicate of soda, if effected in a proper proportion, does result in converting the lime of cement—the ingredient attacked by the bi-sulphite of lime—into an acid insoluble compound, this is not enough, because the residue of this chemical process is caustic soda, which is readily leached out by the liquor. The lining then left, is a mass resembling somewhat a fine sponge through which the liquor percolates readily and attacks the shell of the digester. Mr. Panzl has succeeded in devising a composition wherein a small quantity of hydraulic cement is combined with a proportionate quantity of silicate of soda and which composition contains, **in addition,** other ingredients chemically combining with this caustic soda, resulting from the conversion of the lime in cement, and which are thereby **also** converted into an acid insoluble compound. That is the secret or basis of the success of the Panzl lining.

The space allotted to this article does not permit to consider further in detail the chemical problem, but we shall return to this subject in one of our next issues, as we consider this information of great importance to all sulphite pulp men.

PULP AND PAPER MAGAZINE APPRECIATED.

The increasing interest in Canada as the future pulp and paper making country of the world is shown by the fact that the "Pulp and Paper Magazine" is in receipt of new subscriptions from all quarters of the globe, while old subscribers sending renewals commend the enterprise of the publishers. If this keeps on we shall have to engage an expert capable of comprehending all the known languages, as we are free to admit that we have not mastered all of them yet. Our American friends who are always quick to recognize a good thing when they see it have been liberal with their subscription orders to this paper, and such letters like this one from the Ticonderoga Pulp and Paper Company of New York, make us feel that our course is more than ever endorsed by the public. Here is what C. E. Bush, the manager of the company says:—

"Have received copy of the November issue of the 'Pulp and Paper Magazine," and am so much pleased with the articles perused that I write to say that if we have not made subscription I desire to make two subscriptions, one each to be mailed to the addresses given below. In addition please send to my address 20 pamphlets at 5 cents each in which 'A National Problem' is reprinted for circulation."

We also are glad to note the increasing interest taken in the paper as a medium of publicity. Within the past week we have received orders for space from The M. Garland Co., Bay City, Mich.; The Jones Gregg Co., Rock Falls, Ill.; The Fawcett Preston Co., Ltd., of Liverpool, England; Thomas Gain & Son, Toronto; Panzl Digester Lining Co., New York.

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—J. L. Beebe & Co., Nassau Street, New York,, impressed by the constantly increasing demand for Kraft papers in the United States, have arranged to import the pulp from which such paper is made.

OPENING OF LA TUQUE RAILROAD.

Of special interest to the pulp industry was the opening on November 30th of the La Tuque branch of the Quebec and Lake St. John Railway. Besides members of the Quebec cabinet, several prominent railroad men were present. Arthur Hawkes, of the Canadian Northern Publicity Department, doing the honors for the railway company as representative of D. B. Hanna, president of the Quebec road. The new branch will doubtless do much to open up a region of great wealth in pulp-wood and water-power. At La Tuque the River St. Maurice falls ninety feet, forming water-power of 90,000 horse-power. This has been purchased by Berlin, N.H., capitalists, who have formed a company under the name of the Quebec and St. Maurice Industrial Company, which has agreed with the Provincial Government to spend half a million dollars in the development of the water-power within three years. They have already given up some of the contracts for building barking mills. The new company has signed a contract with the railway company to ship four thousand cars of freight to Quebec annually for a period of nine years. These industries will employ a large number of people and will cause the building of a large town at La Tuque. In fact this has already been commenced, the streets have been laid out and quite a number of houses have been built. Above La Tuque Falls the St. Maurice widens out to a width of half a mile, and there is still water, forming a basin capable of holding all the timber to be cut on the timber limits above the point. There are about ten thousand miles of these limits on the upper river, and its tributaries are richly timbered in spruce.

UTILIZING STRAY PULP-WOOD.

An interesting story comes from Niagara Falls, N.Y., of how W. Thomas, mate of the "Maid of the Mist," picks up a few hundred dollars each year from drift pulp-wood found in the river.

Mr. Thomas finds his wealth in pulp-wood that comes over the Falls, and after whirling about in the currents of the lower river is swept over to the Canadian side and carried up into the eddies by the shore currents, developed in part by the terrific volume of water that plunges out of the portals of the Niagara Falls Power Company.

Day after day, during the summer season, Mate Thomas watches the lower river and the currents. Every few days he makes a find of pulp-wood, and as stick after stick is recovered from the river he piles it up on the river bank a short distance from the steamer dock. As week after week goes by the pile increases. To-day there are nearly 100 cords of wood nicely piled in an orderly manner up from the dock. Soon this supply of driftwood, swept over the Falls from the boom of the International Paper Company, will cease, for no more wood will be brought down the lakes and into the river when navigation closes. When the summer's catch is all in Mate Thomas will hie himself over to this side of the river and sell his crop. He is said to receive about $7 per cord for it, but from this he must pay for help, the cost of haulage and bridge toll, but he will net between $350 and $400 just from watching the river and its currents, and knowing that every stick of pulp-wood helps to make a cord, and that every cord means $6 to $7 to him.

* * *

Thomas Gain has opened an office at 27 Front Street East, Toronto, as commission merchant in papers under the style of Thos. Gain & Son. Mr. Gain, who was for several years with Douglas & Ratcliffe, at first in their Toronto office, and later in charge of their Winnipeg branch, is representing Canadian and American mills, and is open to take further agencies.

ECONOMICAL SIZING OF PAPER.

The high price of rosin has been a great obstacle in the path of paper manufacturers, and although it is now a little cheaper the difficulty is not lessened practically. The points chiefly demanding attention are the following :—

1. The sizing of the paper must depend upon the character of the water available.

2. The sizing must be managed with due regard to the character of the raw material.

3. Good machines, especially for pressing after the wet-pressing, are essential.

Sharp classification of the paper with regard to sizing is essential.

The following remarks may be made under these heads :—

1. If the water is too hard, another source must be found. Artesian wells may be sunk or a supply of better water may be brought from a distance.

2. The drier the paper-web reaches the drying cylinder, the better for the sizing.

3. This is the most important point of all. It is waste of rosin to size the paper more than is absolutely necessary, and the best way of working is to prepare a table for guidance in future working in which certain degrees of sizing, which may be called relative sizing are settled in the following manner. The paper is marked on one side with a one per cent. solution of caustic soda and on the other with a solution of phenolphthalein in dilute spirit. The time required by the lye to get through and redden the indicator is a measure of the absolute sizing. When divided by the weight of the paper in grammes per square metre, the time in seconds gives the relative sizing. The absolute sizing is of course useless by itself, as the time required for the lye to penetrate depends upon the thickness of the paper, and therefore upon the weight of any given area of it, as well as upon the sizing. The relative sizing expressed in time, once it has been done with a paper prepared so as to answer to the requirements demanded of it, and sized as little as possible by means of trial experiments, will serve as a valuable guide in making the same paper again. The following table gives six classes of sizings, and constitutes a scale which the writer has adopted in his practice, and will enable any particular sort of paper to be imitated without waste of rosin, for if the sizing is done at haphazard it will be found that the relative sizing will be too low or too high. In the first case the paper will be too absorbent. In the second there will be waste of rosin.

Class No.	Weight of Paper per square metre.	Absolute size resistance, i.e., time required for the two reagents to meet through the paper.	Relative size resistance, i.e., the time given in the last col. divided by the weight given in the second col.
1—	50 grammes.	5 sec.	0.1 sec
2—	60 "	12 "	0.2 "
3—	60 "	18 "	0.3 "
4—	100 "	40 "	0.4 "
5—	100 "	50 "	0.5 "
6—	100 "	60 "	0.6 "

—Zentralblatt.

PRINTING OF SIZED PAPER.

Certain inks destroy the size, so that the printed portions show through, just as if the paper had not been sized. This has been noticed particularly with coal-tar inks, i.e., those especially used in type-writing, and it is at present a disputed point to which constituent of the ink the effect is due.

The experiments hitherto made seem to lay the blame more on the solvent than on the colouring matter. It must not be forgotten, however, that in certain cases, the sheer mechanical pressure exercised in printing, or in the blow given by the type-writer key upon the ribbon, drives the ink through the substance of the paper, so that the latter becomes a duplicating paper when it is not intended to be such. In the experimental investigation of this matter, which is still proceeding, it was proved that the unprinted parts of the paper were just as well sized as they were before the paper had been used.

PAPER PAILS FOR MILK.

For years London's milk supply has been blamed by medical men and health officers for a great deal of the infant mortality.

Now the dairy companies are to deliver milk at the doors of houses in paper pails or pitchers, which are said to be absolutely proof against germs and water.

The paper pails are being made at a new factory at the rate of 50,000 daily, but they will require to be turned out at the rate of some millions daily if the demand is to be met.

These milk pails, made from wood pulp, can, of course, be used only once. But they will be cheaper than metal pails, pitchers, or glass bottles, for one reason, because all labour of cleaning and sterilizing will be saved.

The pail is a simple contrivance, twelve times lighter than the ordinary milk can, is strongly made and is finished off, after being rendered waterproof, by being sterilized in a furnace heated up to 500 degrees Fahrenheit. Every pail has a close fitting flange cover which can be quickly adjusted, and when fixed, effectually seals the milk from any outside influence.

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CANADIAN TRADE WITH CUBA AND MEXICO.

Editor, "Pulp and Paper Magazine":—

Sir,—Now that we have direct steamship communication with Cuba and Mexico, how is it that the Canadian paper makers do not make more vigorous efforts to extend their markets in these rich and now progressive countries. True, Canada exports between 500 and 1,500 rolls of "news" paper per month to these countries, but that is a mere bagatelle compared with what might be sold them. Many Canadians are under the impression that Cuba and Mexico are only about half civilized, while as a matter of fact they are more progressive in some respects than we are. The city of Mexico alone has 15 daily newspapers, one of which printed in English, issues a Sunday edition, much larger than the Saturday issues of the Toronto "News," or Montreal "Star."

Cuba and Mexico together have a population nearly three times as great as that of Canada. Certainly the Canadian paper manufacturers would find it to their advantage to make some effort to realize the possibilities of such a market. As a first step they should study the needs of the market for paper products generally, and as a second, they should learn to put up their paper in proper shape for shipment to these countries. Of course the Elder Dempster Steamship Company is responsible for damages to shipments while under its care, but many rolls are slightly torn before they are put aboard ship, and they are usually delivered to lighters whose crews are rather reckless in the handling of cargo. The purchaser usually receives his consignment with quite a percentage of torn rolls—a thing that can hardly please him. Canadian manufacturers cannot expect to develop their market unless they study the needs of their customers, and see that their shipments are so put up that they may be delivered in good shape.

—C. McK.

◆

—Leading forestry experts of the Northern States and Canada, met in conference on 12th and 13th ult., at Saginaw, Mich., and gave an impetus to the practical work of reforesting Michigan and surrounding States, particularly the 6,000,000 acres of pine barrens now held as public lands. Dr. B. E. Fernow, of Toronto University, led the discussion on "Taxation and Our Forests."

—J. A. De Cew, Chemical Engineer, Sun Life Building, Montreal, who makes a specialty of patented chemical processes and plants for the recovery of waste products, etc., is making arrangements to do an increased amount of chemical work for paper mills, and in order to have all work attended to promptly, has obtained the services of an additional chemist in his laboratory.

A MARITIME SULPHITE CO. CASE.

Mrs. John J. Stuart, Toronto, is taking suit to recover $250,000 from the Bank of Montreal, which she claims she, at request of her husband, and without legal advice, let the bank have as security for stock in the Maritime Sulphite Company, Limited, of Chatham, N.B. This company was established in 1896, with a capital of $125,000, and when it failed in 1901, was capitalized at $1,000,000. Beginning in 1894 and again in 1896 and 1898, Mrs. Stuart signed agreements and stood security for her husband and his business associates in financing the Maritime Sulphite Company, which required additional capital. This capital was furnished by the Bank of Montreal. In October, 1903, Mrs. Stuart again signed a mortgage in favor of the defendants, on certain lands and stock, as collateral securities. In July, 1904, Mrs. Stuart signed an agreement giving up all her right, title, and claim to the lands and stocks. The plaintiff claims that her husband was induced to procure her signature by threats and intimidation on the part of the bank. She is asking that, owing to the fact that she was never legally advised, all agreements between her, her husband, and the bank be declared void, or in the event of this not being granted, that an account be stated. It is claimed that $125,000 was the amount obtained from the bank originally, and that securities to the value of $250,000 have been obtained by it. It is asked that when the desired account is stated all sums over and above the original loan to the bank be returned to the plaintiff.

The bank, on the contrary, says that they changed their attitude towards the Sulphite Company simply because Mrs. Stuart's security was behind it. In return for the agreement of July, 1904, whereby Mrs. Stuart gave up her right to the lands and securities, the bank released the plaintiff and her husband from all liabilities. This deed was signed, says the bank, by Mrs. Stuart under independent legal advice.

* * *

—From practically all parts of Canada come reports of an anticipated greatly reduced lumber cut. In Nova Scotia and New Brunswick it is said not one mill will be in operation this winter, owing to the demoralization in European and American markets. On the British Columbia Coast the industry is practically at a standstill. In the Ottawa Valley and most parts of Quebec and Ontario, the cut will be materially reduced owing to the falling off in the building trades.

FOR SALE

One second hand revolving rag boiler, in first-class condition, driving gear and all complete, Dimensions: 6 feet diameter by 25 feet long, with 2 doors, working pressure 50 pounds per square inch. For price and further particulars apply to the Cornwall Paper Manufacturing Company, Mille Roches, Ont.

FOR SALE

Cylinder Paper Machine, 72 inches wide, complete from screen to winder, including steam engine, all shafting and pulleys. Reason for selling, replacing by a larger machine. Will sell cheap to prompt buyer. Apply to "Paper Manufacturer," care Pulp and Paper Magazine, Toronto, Canada.

POSITION WANTED.

Superintendent open for Engagement.

A1 on Book, Bond, Blottings and Coating Stock 17 year's experience in different parts of the Globe. Used to the working of daily cost sheets. Would not object to handling a mill making a lower grade with a view to working it up to Book and Blottings. Highest reference as to ability, character, etc. Address M. R. J. care Pulp and Paper Magazine, Toronto.

Position Wanted

A mill manager, having experience in the manufacture of Kraft Brown both in Sweden and England, is open for an engagement with a Canadian mill. Is able to take charge of a paper mill as manager or assistant manager. Address "Kraft," c/o Pulp and Paper Magazine.

Position Wanted.

Tour Boss for 12 grinder ground wood mill; must be first-class pulp maker, and have good knowledge of machinery. Good wages for right man. Address: "J. A. B." care of the Pulp and Paper Magazine.

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GUMMED PAPER.

Gummed paper is a very handy article to have by one, but it has one great fault. By reason of the different hygroscopicities and the different expansion heat coefficients of the paper and the gum it has an apparently incurable tendency to curl up, with disastrous results, especially to the morals of the people who want to use it and find it in that condition. A recent patent taken out for a process to obviate this unpleasant tendency by Tobelmann and Herzheim has been declared invalid by the German Patent Office. Hence there have been crowds of enquiries as to the methods which the would-be patentees have selected. The usual practice is to straighten the paper by pulling it backwards and forwards over a blunt edge, such as is afforded by the side of a table. The invention described by the German patent officials is just an application of this on a large scale. The dried gummed paper is passed over a fixed blunt edge twice, first slantingly, and then so that the length of the paper is perpendicular to the edge of the knife. Both passages cause cracks in the unyielding layer of gum, but those caused by the second passage cross those caused by the first. The result is that the gum coating is broken up into rhomboidal forms, which, while adhering as close as ever to the paper, do not form a continuous mass, so that their individual shrinkage has no effect on the flatness of the paper.

There are, however, far better and cheaper methods of preparing gummed paper which will not curl up. An addition of glycerine to the gum used has been tried. It was a failure, because although the curling was effectually prevented, the gum never dried on account of the hygroscopic properties of the glycerine. The solution of the problem is to be found in the use of soap, a process which cannot be patented. All that has to be done is to dissolve the gum in a solution of a good hard soap. Unfortunately, it is impossible to give any definite recipes. Soaps differ and gums differ. What the manufacturer has to do is to select a gum and a soap about both of which he is fairly certain he can secure a constant supply. He can then discover the best proportions between the two, the best strength of soap solution, etc., by laboratory experiments. The figures which give the best results having been recorded will supply the necessary data for large scale work as long as the soap and gum remain of the kind originally tested.—Centralblatt fur Papier verarbietungs Industrie und Handel.

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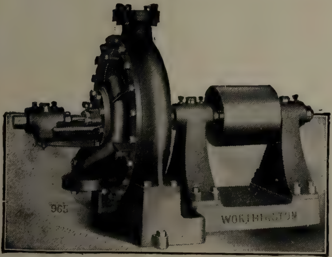

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THE MARKETS.

Toronto, December 14th, 1907.

The financial reaction has undoubtedly affected business in Canada to some extent, but it is probable that the paper trade has been less adversely influenced than almost any other line. For this, no doubt, the facts that demand had been keen for so long and that stocks were light, are largely responsible. Just now also there is the additional impetus given by Christmas advertising matter, fancy paper boxes for candies, gifts, etc. The turning off of hands in the lumber camps is likely, on the whole, to have a good effect on the production of pulp-wood logs, for which, unlike lumber, there is a continued strong demand. Wages in the cutting camps also rule lower. Prices for news, while not at the moment tending higher, keep firm and there is not much prospect of any decline. Book papers are steady at the recent advance. Boards show an advancing tendency. The prospects for pulp production in the Chaudiere are excellent, the water continuing to flow in good shape, whereas across the line the Burgess plant and part of the International at Berlin are closed down owing to shortage of wood. Ground wood fetches $22 at the mill, sulphite about $2.15 to $2.25.

British.—The mechanical wood pulp market is firm at £3 to £3 2s. 6d. for moist, and £6 to £6 5s. for dry. Chemical pulp is very firm, being well sold up for 1908 and 1909. The chemical trade is quiet, but contracts are often in sellers' favor.

SCANDINAVIAN PULP AND PAPER.

A movement is on foot among the farmers, who mainly own the forests, to advance the price of pulp wood. "Farmand" points out the unreasonableness of this course, as though it is true the mechanical pulp mills are now making money, this is only within the last two or three years.

Mr. Sontum, trade agent at Christiania, reports that the Swedish and Norwegian paper makers have recently met, and have decided that, as the production of news print in both countries for 1907 and 1908 is already disposed of at rising prices, a considerable increase in price should be asked for future sales.

PAPER STOCK MARKET REPORTS.

Montreal, Dec. 18, 1907.

There is a fair demand for paper stock, with not much change in prices. Quotations range about as follows:—

Unbleached cuttings	...$4 50	to	$5 00
White shoe clips	.... 4 50	to	5 00
Colored Shoe Clips	...... 3 00	to	3 25
Domestic white rags	.... 2 25	to	2 50
Blues and thirds	...... 1 25	to	1 50
Roofing stock	 90	to	1 00
Manilla rope	.... 2 50	to	2 75
Waste papers	 90	to	45
Bagging	 90	to	—

KRAFT-BROWN.

An English correspondent writes on the outlook for Kraft-Brown in Great Britain to the effect that manufacturers cannot make enough of it. A good many of the best orders are for export to United States; Scandinavia is booked up for next year, and 1909 for the United States, so one can see there is a big demand. There is a fortune for any Canadian mill starting on this paper, as for prompt deliveries you can get any price you ask for it. The only difficulty in England is getting hold of enough pulp, there are not enough pulp mills making soda pulp and the demand is great.

We may remind readers that in Canada also there is a dearth of soda pulp, the best market being in the United States, while the soda mills which do exist are, as a rule, scarcely up-to-date. In order to make Kraft Brown a success in Canada, more sulphate mills are needed.

THE **Swenson** EVAPORATOR

Boils off Water, not Spent Caustic.
Is easily kept clean.
Seldom repaired, and then with ease.
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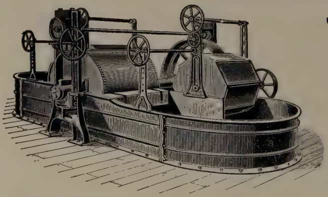

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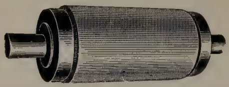
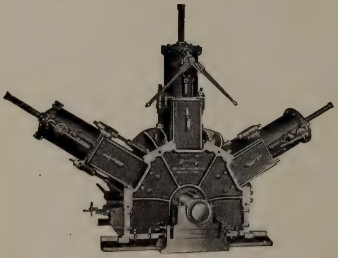


Cotton and Paper Rolls with Patent Fastenings.



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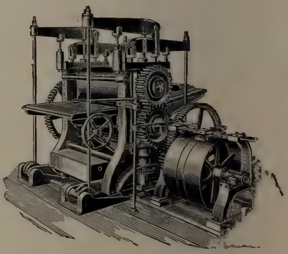

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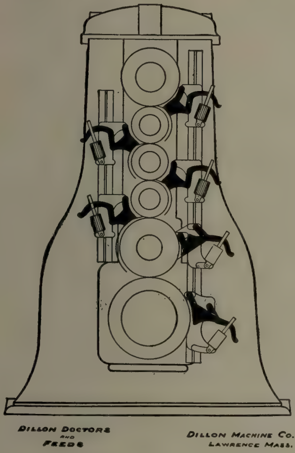

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Stuff Pumps, with Dillon Patent Valve Seating
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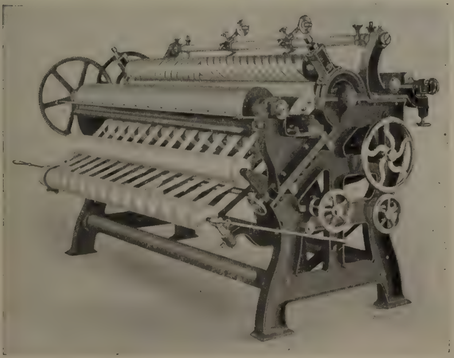

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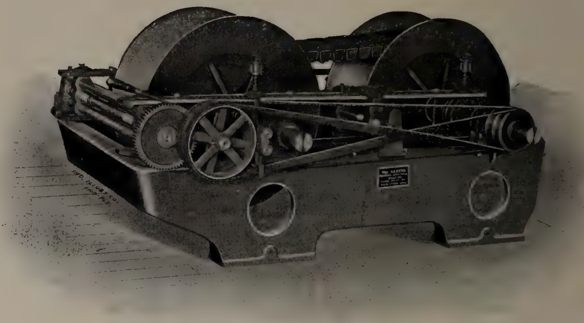

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IS THE SAFEST AND BEST MATERIAL FOR

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The composition and the system of constructing of Panzl Linings are patented in all countries where wood pulp is being manufactured by the sulphite process. **The PANZL U.S. Patents have been adjudicated to be valid in law** and wholly independent of the Russell Patent and all other prior patents relating to linings of digestors.

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Diminution of wood by barking 16 to 18 per cent. according to size and quality of wood.

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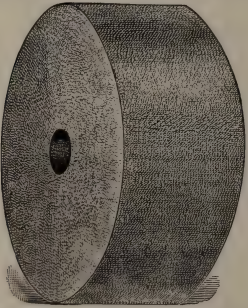

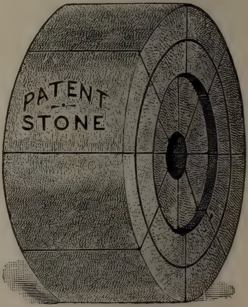

the construction of which gives to it advantages not found in the one piece stone.

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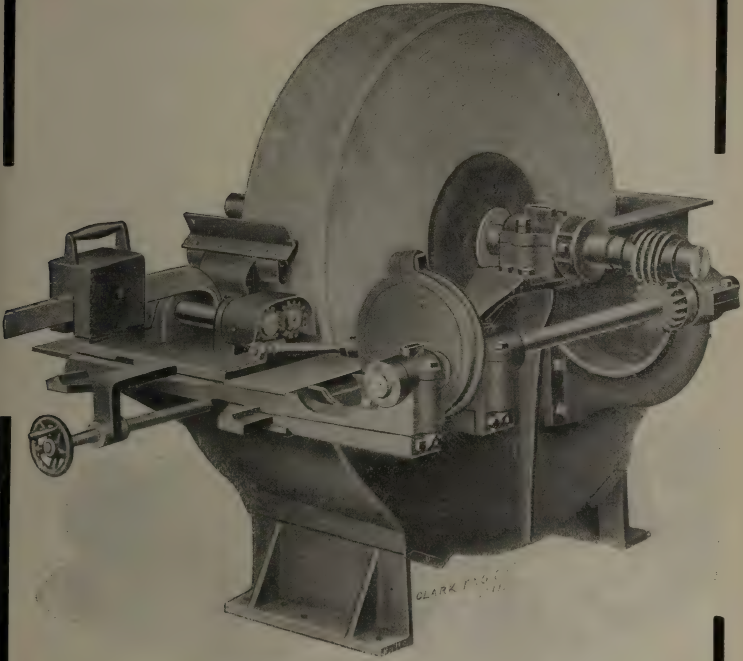

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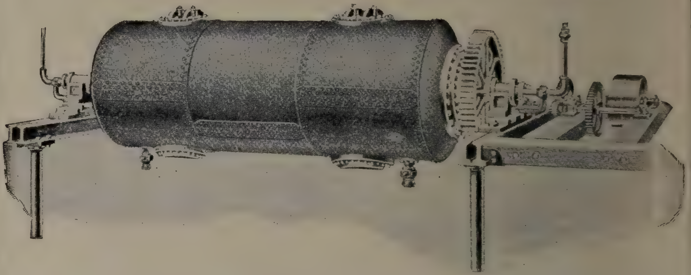

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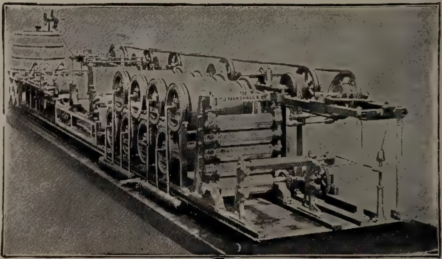

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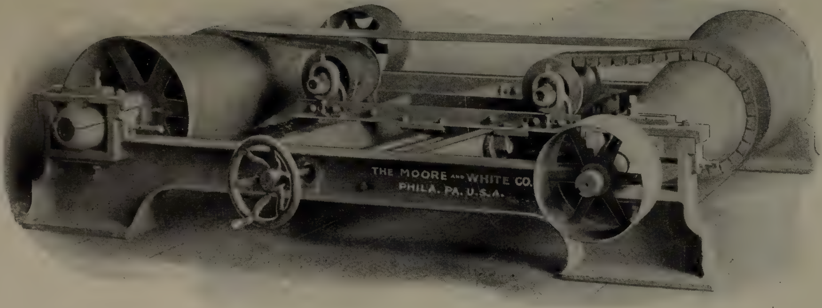

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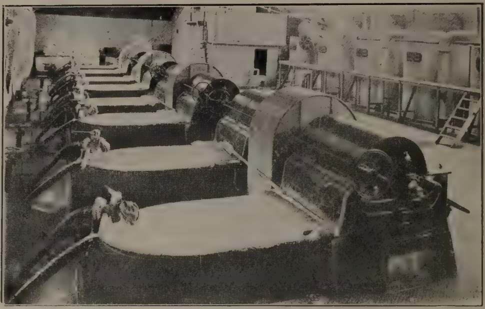

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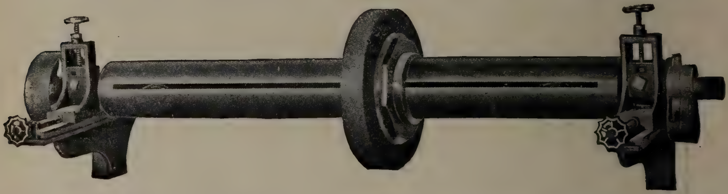

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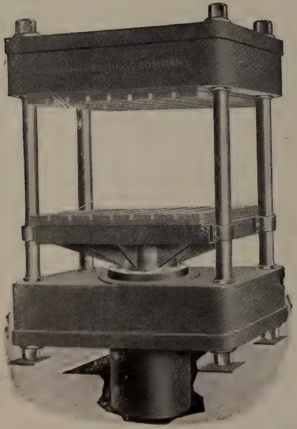

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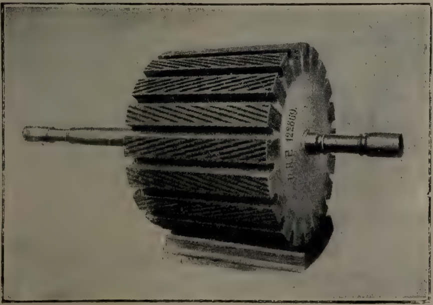

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Over 300 Rolls actually at work, partly during 5 years.

Many Repeat Orders from British and Continental Mills.

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The Screen Plate is so arranged that it **positively cannot clog.**

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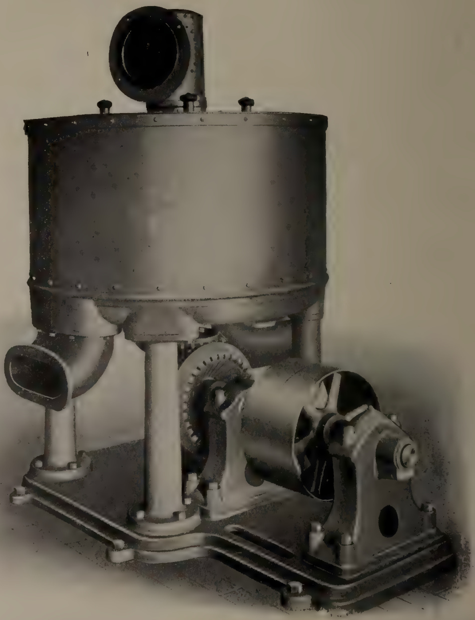

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Knives never wear out.
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Driven by 8-inch Belt.
Maximum Speed Can Always Be Maintained.
New Plug and Shell Can Be Put In in ½ Day.

All iron and foreign matter is removed by the screen. As practically half the repairs on the Horizontal Jordan is caused by the presence of iron and foreign matter, new plug and shell for the Vertical Jordan cost no more than refilling the old type.

The Machine is Now in Practical Operation and is Demonstrating Our Claims Every Day You Cannot Afford to Be Without it.

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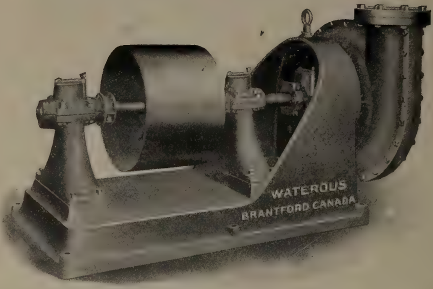

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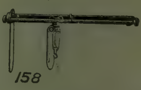

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